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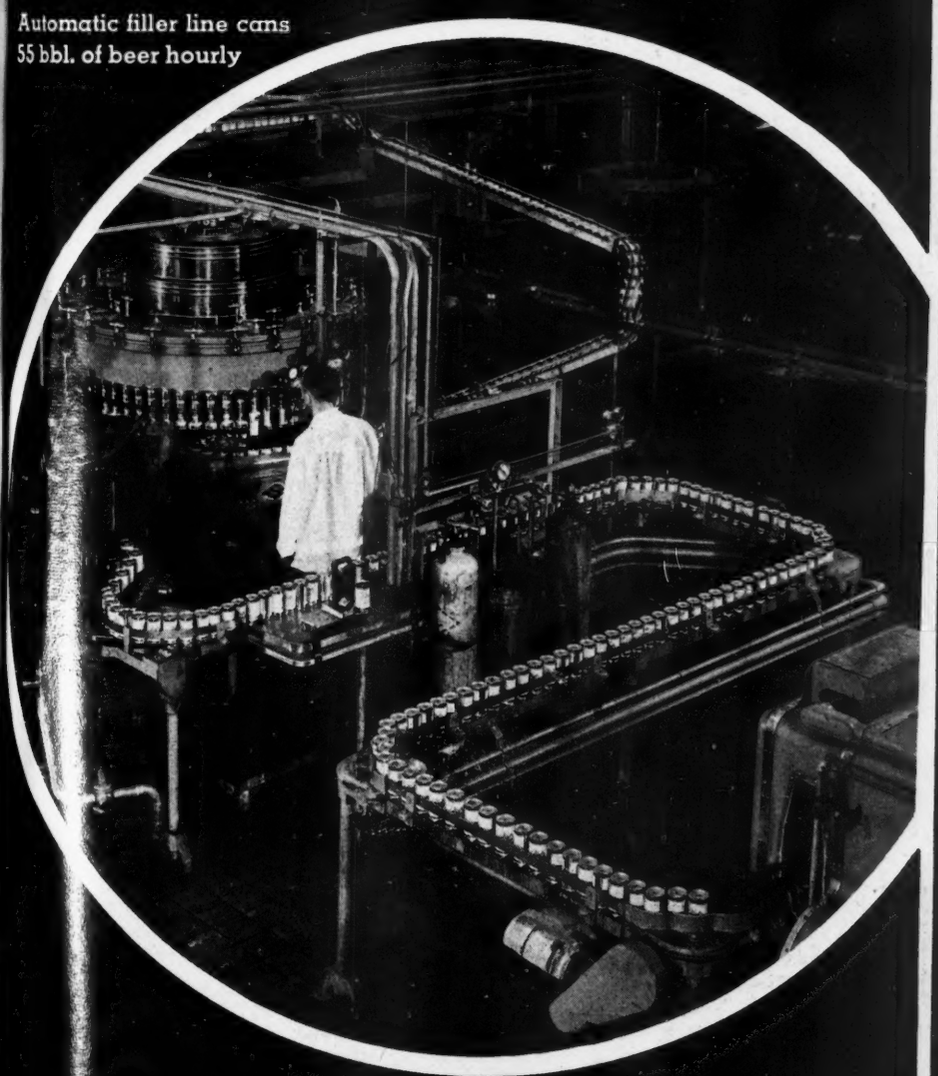

Automatic filler line cans 55 bbl. of beer hourly

SEPTEMBER 1948

Food Processing Production Index

New Blatz Bottling Plant is Last Word

How to Improve Human Relations

Continuous Dry Corn Milling

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Sanitation Bonanza From a Mop Bucket

Lowering Costs in The Ice Cream Plant

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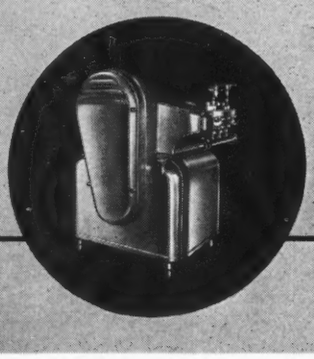

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FOOD INDUSTRIES

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THE COVER—Beer cans are kept on the move in new Blatz Bottling Co. filling plant, Milwaukee. Cans (top) roll to 60-spout filler, then are closed, some are check-weighed. Conveyor moves sealed cans into pasteurizer (lower right). For story on this operation, see page 76.

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FOOD INDUSTRIES

SEPTEMBER, 1948

Food Technology Grows Up

EIGHT years ago, the Institute of Food Technologists held a highly significant conference in Chicago. This meeting was important because it was the first annual conference of the then new and much needed organization. The IFT had been established about a year earlier and had 800 members, 480 of whom went to the meeting to learn about the new developments in food technology and engineering reported by the speakers.

The eighth annual IFT conference, held this summer in Philadelphia, was highly significant, too. More than a thousand attended. The program was packed solid with 57 papers and two round-table discussions. So great was the amount of new knowledge to be reported that two, and sometimes three, sessions were held concurrently. There was something on the program which touched directly or indirectly on almost every branch of the big and complex food processing industry. Equally significant was the report that the IFT now has about 2,500 members, counting full, associate and affiliate memberships.

The growth of the IFT in this short span of years demonstrates that food technology has indeed become a profession—if somewhat belatedly. The growth is particularly surprising in view of the fact that the teaching of food technology as a course is really only just getting seriously underway. As more and more educational institutions recognize the importance of food technology by introducing courses and giving degrees, the already mature profession will snowball into terrific proportions. Happily, there is a trend in this direction in higher educational circles.

This growth of food technology is good news for the food processor and for the consumer. It guarantees more rapid technological progress. And this, in turn, means new and better processes for the food manufacturer—processes which not only improve quality but reduce costs through higher efficiency. It also means better taste and nutritive values in established foods and the development of new and improved products for the consumer.

But if the food processor is to capitalize on this important trend, he must gear his thinking to it. He must bring himself around to a full appreciation of what a competent food technologist can do for him. He must put technologists on his payroll and cooperate with them in an honest effort to solve troublesome problems and to further improve processes and packages which are not a source of headaches but which are not all they could be. He must back these technical men financially as well as morally. They must be provided with research and quality control facilities. They must have enough authority to get the results of their work put into practice. They must have the cooperation of engineers and operating men in the plant. And they must have time to carry research work to conclusion. New knowledge cannot be dug up like fishworms.

Perhaps there are as many practical food plant executives who expect too much too fast from food technologists as there are those who don't expect much of anything and therefore don't hire these professional men. A good food technologist is worth many times his salary, but don't expect him to produce miracles immediately. And don't forget that your business is so complex that you may have to back up one technologist with others of different training and experience and with engineers who can put a process into practical operation. This may be a horrifying new thought to some food processors, but it has long ago been accepted in many other progressive industries, such as chemical processing.

And here is a situation that the educators should note well. There are too few food technologists and engineers in the country to provide the technical manpower that the great food processing industry really needs.

F K Lawler

EXECUTIVE EDITOR

The Talk of the Industry

• SEVERAL important trade associations are urging their members by messages from Washington to set up industrial arrangements "for any emergency." Obviously, they mean get ready for war. This advice may not be needed, as all hope. But it's good advice for food factory managers too. Plans to adjust to wartime conditions ought to be made even though we never have to use them.

• DON'T be surprised if one of the favorite carbonated beverages ceases to be available in the king-size 12-oz. bottle. Already the quantity has dropped to 8 oz. in one area and 6 or 6½-oz. bottles are rumored. With the high costs of labor, raw materials, and distribution there is a limit to what a food processor can put out for a few cents.

A lot for the money is a wonderful sales asset. But it can become a first-rate profit liability when economic factors shift. The sad part of it all is that long-range economic forecasters are no more accurate than long-range weather predicters.

• WE recently learned of a manual food packaging operation which costs one plant several hundred dollars a day. No one needed to tell the management of this plant that there ought to be a less expensive way of doing it. They figured that one out themselves and called in a consultant. The idea is to do the work by machines at about one-tenth the present cost.

When the stakes are that high you usually won't lose by gambling real money on being able to find a solution to the problem.

• THE basis on which organized business will continue opposition to resumption of price and commodity controls by the government has been well stated very briefly by the Chamber of Commerce of the United States in the following language: "Price and ration controls broke down long before Congress in 1946 abolished OPA. . . . Let us not assert that price controls were abolished too soon. They broke down and would again if reimposed."

• NOT all confectionery manufacturers are happy about the trend to stainless steel in processing equipment. A couple voiced their thoughts at the session on sanitation at the NCA convention. They saw no reason why present equipment and cleaning methods were not satisfactory—and anyway the new stainless steel units cost too much. These questions they put pointedly to representatives of the New York City health department with the implication that the situation was all the fault of unnecessarily rigid specifications by that department.

As the innocent bystander, we felt that the health authorities had the best of the argument. Certainly they do not specify that certain metals be used, only that the "product zone" of equipment be of sanitary construction. Our conclusion was that they were doing nothing that was not for the good of the industry. They really are pretty reasonable fellows.

• SALES of frozen foods are being effectively pushed in the Jamaica area of Long Island by the large Gertz department store. About two years ago, Gertz opened a self-service frozen foods store at the entrance to its parking lot. After staying overtime on a shopping trip in the store, housewives often pick up easily prepared frozen foods on the way to their cars.

But that is only a minor part of the Gertz strategy. The store sells home freezers on the installment plan, and its salesmen promote the freezers and the advantages of frozen foods in a house-to-house canvass of the area. Then the store makes free-of-charge deliveries of frozen foods each week to the owners of the home freezers, orders being solicited by telephone. In other words, the appeal of frozen foods is used to sell the freezers, then the freezers create a steady high-volume demand for the frozen foods. And the whole operation is doing nicely, thank you.

Gertz carries many different brands, stored in quantity in zero coolers. The store buyer is fussy about quality, is receptive to new items. The store stands behind the products, with the result that customers regularly buy foods which are unknown to them.

What the frozen foods industry needs is more stores like Gertz.

• OPTIMISTIC crop reports have come in from many parts of the world, including Western Europe. But after getting off to an excellent start the weather reversed itself in Europe. James H. McGraw, Jr., reported from Paris in mid-July that Western Europe was having the worst weather in history—cold, rainy, and no sun. It remains to be seen what this does to the production of food over there, indications are that the harvest still will be the best in years.

Hors d'Oeuvres

• A report to ACS has it that "sour milk acid" may be used in the manufacture of plastics, which will "relieve the drain on the heavily burdened petroleum chemical industry." Anyone have any ideas on how to relieve the drain on the heavily burdened milk producing industry?

• *Out in the State of Washington, according to Business Week, some farmers are using special shot gun shells containing pollen and a carrier, to jog up the sex life of their apple trees. Five shots will take care of a large tree. Naturally, just brandishing the gun would be no good with apple trees.*

• An anonymous contributor tells us that the 1947 gross income from chickens and eggs was $3,099,378,000. Looks as though another term will have to be found to convey what used to be meant by "chicken feed." While you are at it, you can also cross off "peanuts."

• *USDA asked Congress for a wartime alcohol plant so they could experiment on new uses for surplus farm products. Congress handed over three—figuring, apparently, that this was three times as good. So USDA's first experiment can now be devoted to finding new uses for surplus alcohol plants.*

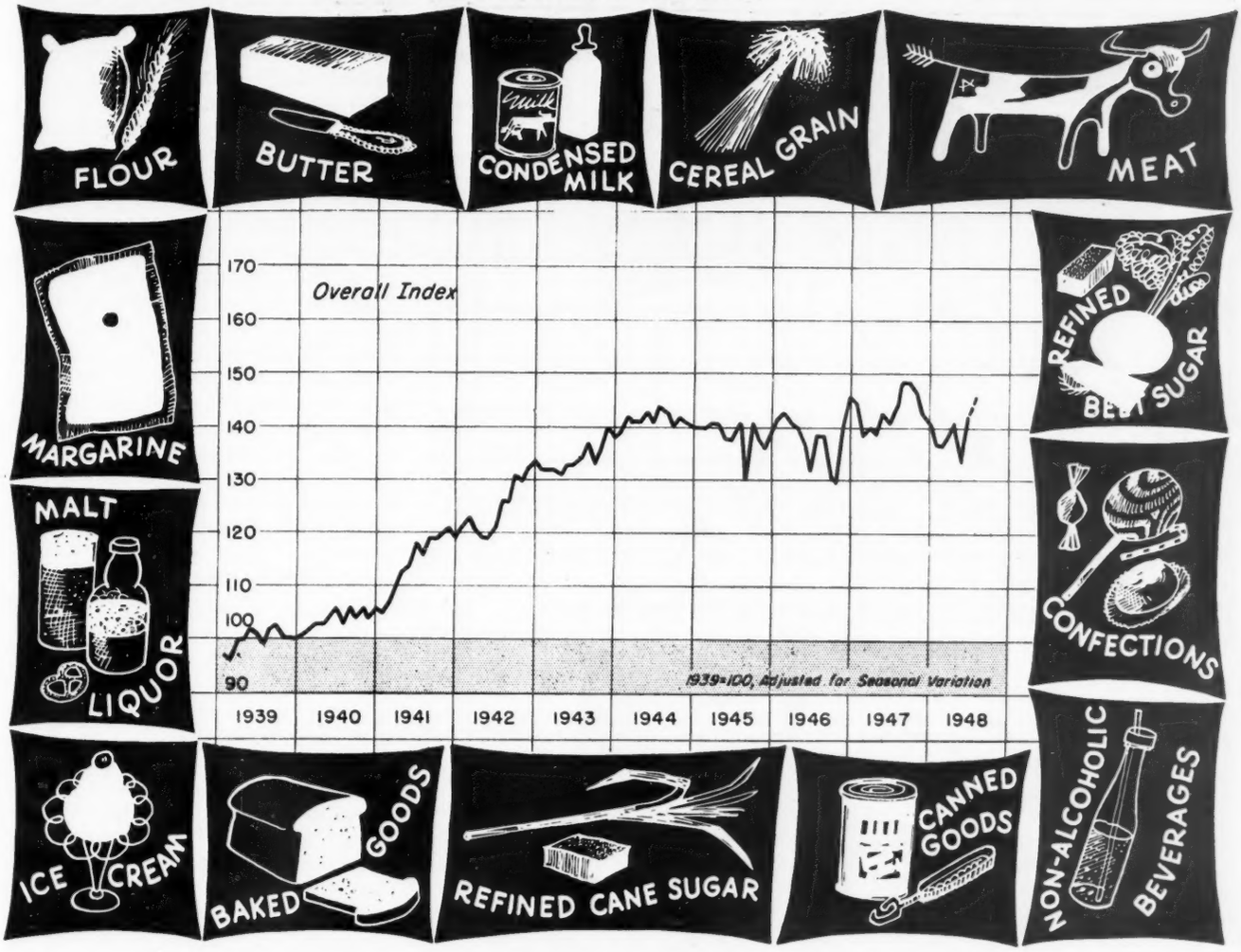
• If you are confused now, just wait 'til they start evaluating farmland on the basis of vitamins per unit of production. What do you suppose a pack of spinach without the vitamin count on the label will be worth then?

• *Hong Kong importers are complaining that Australian beef extract no longer comes in the familiar opaque glass jars, but in old ink bottles. Anyway, that might mean they're still opaque—unless someone got careless and washed them.*

• One of our callers-to-attention calls our attention to a *Washington Post* headline: "U. S. Flies in Milk, Food for Germans." Hope the Russian propagandists don't get hold of it.

• *Tattooed fish will be turning up in Missouri because the State Conservation Commission is using that method to number them as an aid in growth and migration studies. Knowing this in advance is going to spare Mo. fishermen a lot of needless "swearing off."* J.A.J.J.

A SPECIAL NEW SERVICE TO FOOD INDUSTRIES READERS . . .



Food Industries Index Of Processed Food Production

A new department is here introduced, which is designed to make it possible for the individual food manufacturer to compare his production, month-by-month, with a seasonally adjusted index for his branch of the industry

WITH this issue FOOD INDUSTRIES introduces its Index of Processed Food Production.

This Index is designed to give food manufacturers an at-a-glance report on what is happening in the industry as a whole and specific reports on 14 major branches of the industry.

Foods today are very much in the news. The high cost of living, of which food is an important part, is a major issue in the Presidential election. Last year Americans spent one-third of their income for foods. In 1939 they spent about one quarter of their incomes for food. This is partly because prices are higher now, but it is also true that people are eating more, and eating better quality foods, than they did before the war.

Need Standards

Today management in the industry, which serves such an important section of American peoples' needs, is seeking more and more information about the industry. Each food processor can tell little about his own progress unless he has a standard against which to compare his company's performance. He needs to know the outlook for the entire industry and he needs to know what is going on in his own section of the industry.

The new FOOD INDUSTRIES INDEX is designed to supply much of that information. It will give food processors a base for interpreting the month-by-month changes in the industry and in major sections of the industry. It will give the industry an up-to-date record of production, the trends in major lines, and a base that will help outline future trends.

Every Month

The Index will be presented monthly in FOOD INDUSTRIES. It will show what is happening nationally in food processing. The Index is currently at 146. Since the base is 100 — which means that the Index was at 100 in 1939—the industry is currently producing at a rate of 146 percent of the 1939 average.

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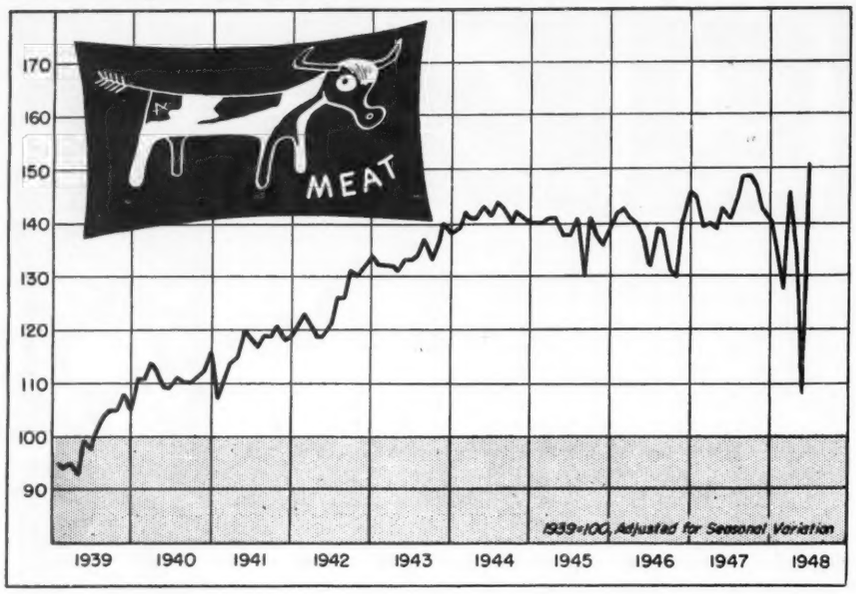
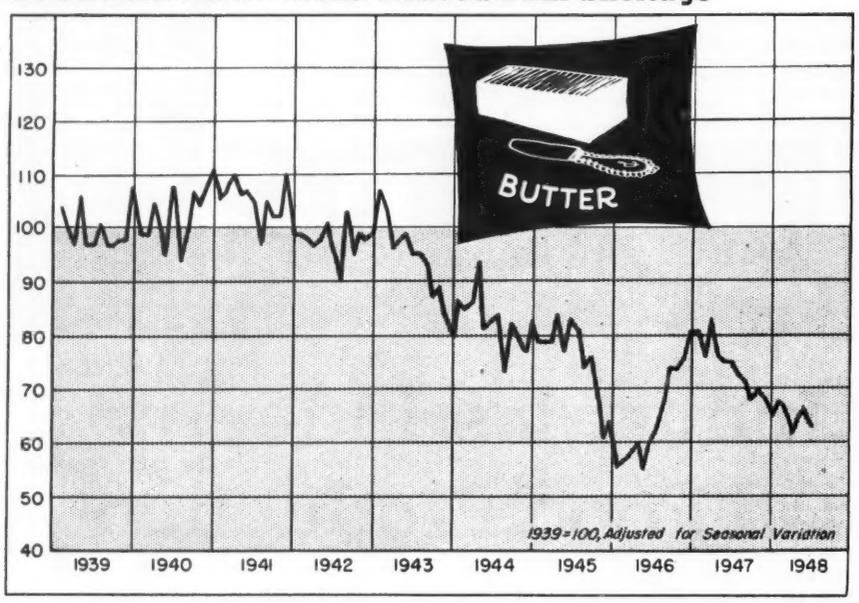
Meat Drops During Strike, Comes Back



Downward Butter Trend Reflects Milk Shortage



Similar indexes show what is happening in each of 14 major lines. These are: meat slaughtering and packing, condensed milk, butter, margarine, canning and preserving fruits and vegetables, beet sugar refining, cane sugar refining, flour, baking, confectionery, cereals, ice cream, non-alcoholic beverages, and malt liquors.

Each month FOOD INDUSTRIES will present in modified graphic form, the total index and the 14 separate indexes. These will show a preliminary figure for last month's total food index and final figures for the preceding months of this year and all of last year.

The Index is based on reports of the Bureau of Labor Statistics of the Department of Labor. Later in this article we will explain in detail how it is developed. But right here we will outline some of the ways in which it may be used by FOOD INDUSTRIES readers.

How to use the Index

The most important use of the Index —from the viewpoint of any manufacturer—will be in giving him a picture that he can set against his own production reports to find out how he stands in the parade.

To make the most of the Index in doing this, of course, any individual company must allow for special conditions. In the ice cream industry, for example, peak sales may come at different times of the year in different sections of the country. The FOOD INDUSTRIES INDEX shows production adjusted for seasonal swings. In other words, these seasonal peaks and drops have been eliminated from the Index.

How to Adjust

So any manufacturer who compares his production reports with, say, the ice cream production curve in FOOD INDUSTRIES, must make allowances for

Percentages Used in Seasonal Adjustments

These are the factors employed to eliminate seasonal variations. They apply to all years encompassed by the F. I. Index.

	Jan. percent	Feb. percent	Mar. percent	Apr. percent	May percent	June percent	July percent	Aug. percent	Sept. percent	Oct. percent	Nov. percent	Dec. percent
Meat	−18	−10	+ 2	+ 4	+ 8	+ 4	+ 4	+ 7	+ 11	+ 11	− 6	−17
Condensed Milk	+11	+ 8	+ 5	0	− 9	−18	−14	−10	0	+ 5	+ 10	+12
Ice Cream	+12	+11	+ 5	0	− 2	−12	−18	−16	− 4	+ 2	+ 9	+11
Flour	− 5	− 3	− 1	+ 5	+ 5	+ 2	+ 1	0	− 1	− 1	− 1	− 1
Cereal Grains	+ 1	− 1	− 4	− 1	+ 2	0	+ 1	+ 3	− 7	+ 1	+ 3	+ 2
Baked Goods	− 2	− 1	0	0	+ 3	+ 3	0	+ 1	+ 1	0	− 2	− 3
Refined Cane Sugar	0	− 2	− 1	− 4	− 2	− 4	0	+ 2	+ 5	+ 6	+ 2	− 2
Refined Beet Sugar	+27	+51	+55	+52	+49	+47	+48	+33	+ 15	−106	−172	−99
Confections	− 4	− 1	− 1	− 3	+ 2	+ 2	+18	+13	+ 4	− 9	− 9	−12
Non-Alcoholic Beverages	+ 7	+ 7	+ 4	+ 4	0	− 9	−12	−10	− 3	+ 4	+ 3	+ 5
Malt Beverages	+ 3	+ 4	+ 4	+ 2	+ 3	− 2	− 4	− 3	− 4	− 4	+ 3	− 2
Canned Products	+39	+40	+43	+38	+36	+19	−33	−82	−109	− 32	+ 14	+27
Butter	+21	+14	+10	+ 1	−32	−41	−31	−11	− 1	+ 19	+ 25	+26
Margarine	−15	−22	−11	+ 8	+15	+20	+17	+13	+ 4	− 8	− 14	− 7

the seasonal swings in his business. He can take his own production figures, measured in gallons of ice cream produced each month, for example, and convert them to an index. He can do that by using an average 1939 production figure as 100 and figuring other years or months of production as a percentage of the 1939 figure. That will give him an index on the same basis as the FOOD INDUSTRIES INDEX.

At this point he can adjust his index for seasonal factors. By consulting the adjustment table, he finds the adjustment for June to be —12 percent. That tells him 12 percent of his actual output in June was to be expected as the normal seasonal increase, and should be discounted for purposes of comparison with the overall production picture. On the other hand, if the adjustment factor were plus 4 percent, he would add 4 percent to his actual production figure when comparing with the overall chart for his branch of the industry.

To Make Broader Comparisons

If a food manufacturer has several products and wants to compare his overall business with the overall FOOD INDUSTRIES INDEX, he might do it by using his figures on dollar volume and deflating them—adjusting them downward — to allow for the increase in prices of his products made over the period covered by the Index. He can get a better comparison by putting each group of his products up against the portions of the index that correspond to them. He could check his ice cream business against the ice cream component of the index, for example.

How the Index was Constructed

In working out the Index, FOOD INDUSTRIES co-operated with the McGraw-Hill Department of Economics. The chief problems in approaching the question were those same seasonal factors that practically every section of the food industry has to contend with.

Almost immediately a fact important to food processors emerged—the pattern of seasonal swings in the industry changes from year to year.

This shifting is not the result of seasons only; it is the result of changes in consumer tastes, more extensive warehousing facilities, lengthened production processes, advanced agricultural technics — improved man-made facilities which take some of the "whether" out of the weather.

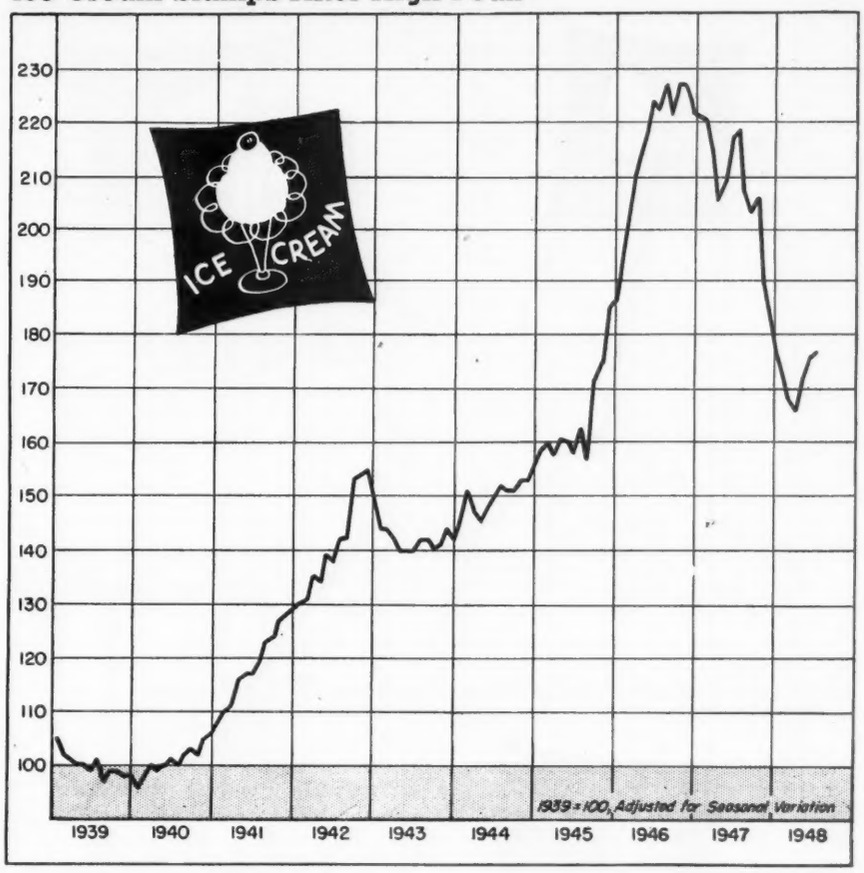
There are examples of this in all of the different branches of food industries. Ice cream, for example, before the war had a very pronounced peak in the summer, hitting the top in June; then it started down to wallow in its winter doldrums. Nowadays, ice cream is becoming more and more to be accepted by consumers as a good year-around dessert. Its June peak has developed into a June-July-August plateau, and its winter slump, although it still exists, is shallower.

The seasonal change in meat-packing is another that is gradually being flattened out. Better storage facilities of the packers keep a steadier flow of meat going to the butcher shops during the year. And more extended processing methods are helping to smooth out the peaks and hollows of the animal slaughtering.

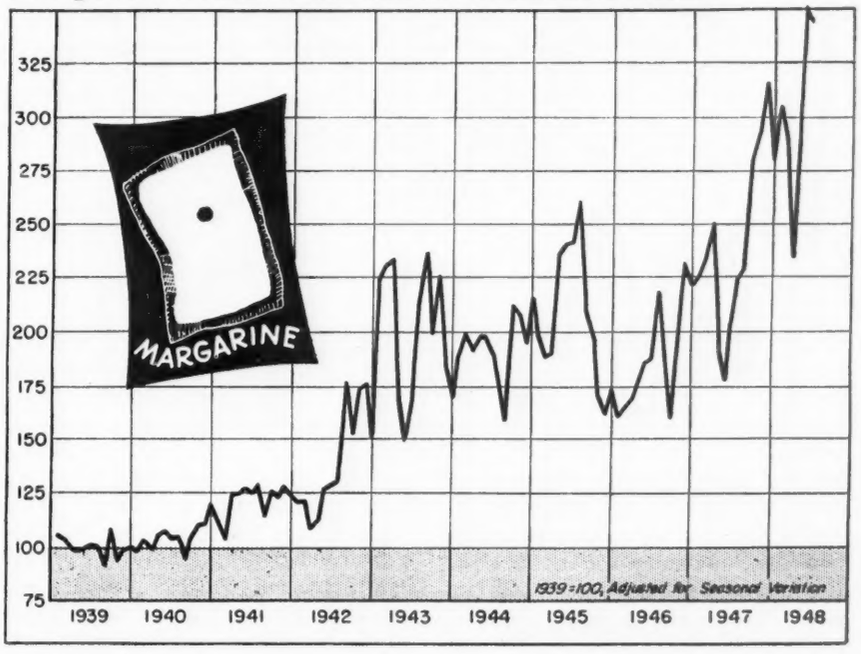
Changing Technics

Better freezing, canning and preserving technics make vegetables and fruits available to the consumer over

Ice Cream Slumps After High Peak

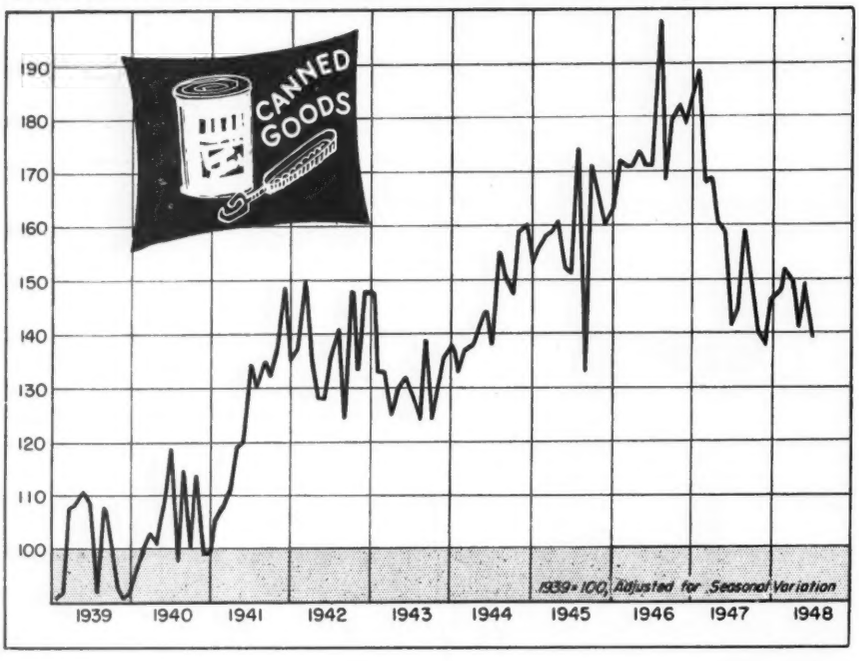


Margarine Leads Them All in Production Gain



Condensed Milk Enjoys Healthy Gain

Canned Foods Production Doubles, Then Drops



the year instead of only "in season." And improved baking processes are leading the housewife to buy her baked goods at the store, rather than to spend her time standing over a hot stove.

Crop Variations

But storage technics have not advanced so much that fresh foods, such as fruits and vegetables, can be stored indefinitely before they are processed. So there is still the heavy impact of the seasonal nature of crops on the index of canning and preserving and beet sugar refining. These two series are subject not only to the seasonal factors of the crops' harvesting, but to the size of the harvests. Some years with good planting and growing weather the crops are large; other years a late frost or other weather calamity make crops smaller. This has a profound effect in the canning and preserving industries, and in the refining of beet sugar. Large crops will expand the seasonal peaks in activity; small crops will contract them. This kind of situation makes it necessary to revise the seasonal adjustment factors every year.

"Seasonal" Eliminated

Since we are trying to find out how the food business is doing from month to month and from year to year, we have to take out seasonal influences. Suppose production goes up 8 percent in June, but the usual increase is 10 percent. We see immediately that business is down, not up as the output figure would seem to indicate.

The chief virtue of an index is its usefulness to the industry. A seasonally adjusted index makes it possible to tell not only what is happening in foods but to compare foods with other industries and with general business. Each manufacturer can check his business with the trends in all food processing, and with what's going on in all manufacturing.

Making the adjustments for seasonal changes clarifies the trend of business. And knowing the probable direction of business gives a more solid basis for planning.

Best Yardstick

When FOOD INDUSTRIES decided that food processors needed an index of processing activity, it took a careful look around to decide what would be the best measure of business, not only in all processed foods, but also in the main lines of food processing—baking, beverages, cereals, confectionery, dairy products, fruits and vegetables, and meats. It wanted to get an index that would have the widest possible coverage of the food processing industry and the most complete coverage of the major lines within the industry. It had to be an index that the manufacturers of selected food products could use as a yardstick against which they could compare their own output. And it had to be one that would be a good measure of how things are going in the food processing industry as a whole. Each dairy products manufacturer, for example, should be able to tell how his butter production compares with all butter production and how his condensed milk output compares with the output of all processed milk.

Three Possible Bases

In the course of looking around, FOOD INDUSTRIES analyzed several possibilities for the construction of the food index and the components it should include. For one thing, we wanted to leave out animal feeds and grains. We wanted to leave out exports of grains and animals. We wanted the index to represent as nearly as possible the amount of food processing that goes on in the country—processing of food for human consumption.

How could this be done? Three possibilities were investigated. First is an index based on physical production. Production is a good measure in industries such as steel, which have relatively few plants, are organized on a national scale, and for which reliable data are available. It's just a question

of toting up the tonnage and converting it into an index.

But most of the food industries are made up of numerous small plants, organized on a local basis, many of which cater chiefly to relatively small local areas. It is well-nigh impossible to collect reliable statistics on manufacturing in an industry that is as widely dispersed as is most of food processing. The figures simply do not exist. Production figures are not collected in all of the food industries on a nation-wide scale. And even in an industry such as meat-packing, where statistics on slaughterings are available, it is possible to get more extensive coverage—coverage which would include meat processing activity, as well as slaughterings. The absence of figures giving sufficient coverage forced us to look for another method.

A More Satisfactory Method

The next possibility was the use of the dollar values of the output of food products, as a basis on which to measure changes in production. But this method presented certain problems, one of which is known, in the statisticians' jargon, as "weighting."

Weighting is the method of allotting relative values to each of the components in the index. What has to be done is to work out how important, say, meat slaughtering is to the whole index, and so on, through all the branches of the industry covered. It is the problem of adding apples and oranges—and a host of other products—and coming up with a meaningful answer.

Unreliable Value

Another stumper to the use of dollar value figures is that there is always the problem of the changing purchasing power of the dollar—which everyone knows something about nowadays. A yardstick of food production based on dollar value would measure not only production but prices—and it would be pretty hard to correct for price changes.

It is possible to work out a so-called price deflator, a measure of price changes that could be used to correct the dollar value figures for price shifts. But it would be a complicated procedure. For one thing, prices do not change at all uniformly. For another, there would again be the problem of weighting. Finally, it is pretty difficult to get good price statistics on a nation-wide basis that would fit the index and the components that FOOD INDUSTRIES wanted to use.

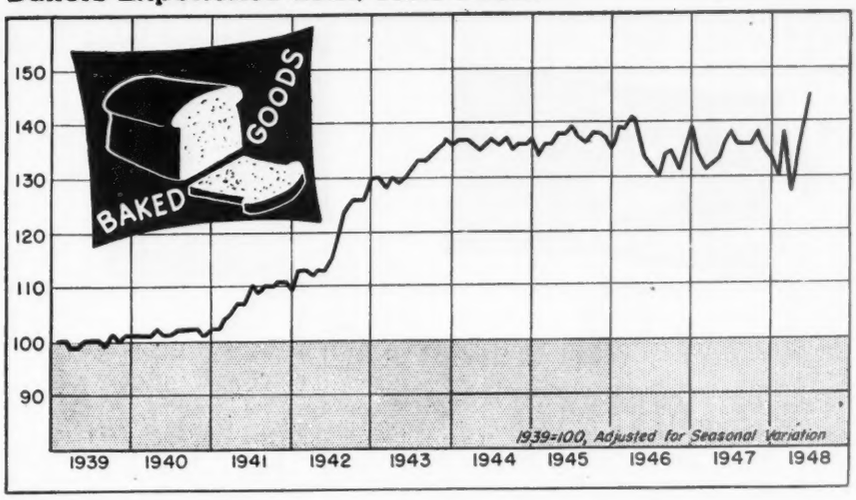
Came to Employment

The third method, which we studied carefully—and finally decided to use in working out this measuring-stick of food production—is man-hours. This is employment adjusted by the average number of hours worked. This scheme has a number of advantages over the other two we looked at. They are:

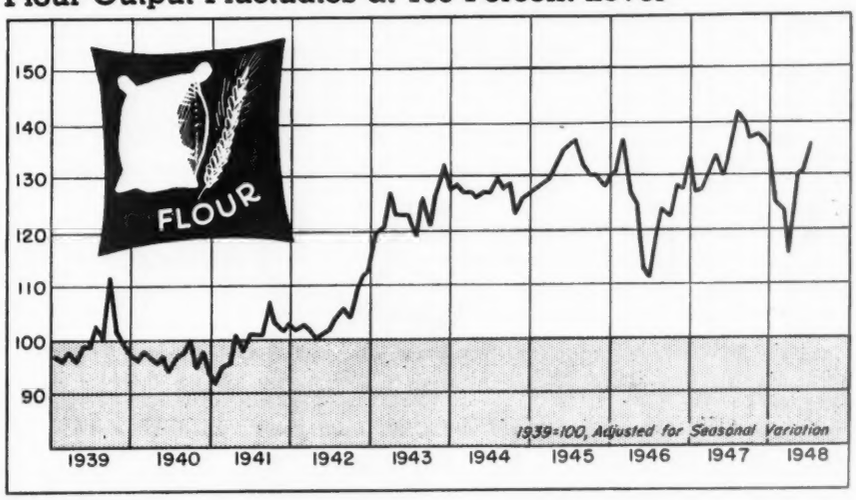
1. Reliable data on both employment and the average number of hours worked in a week are collected every month by the Bureau of Labor Statistics. These figures cover more food industries than we could include any other way.

Using these figures not only makes it possible for us to have a better coverage, but they also mean complete industry coverage. Government em-

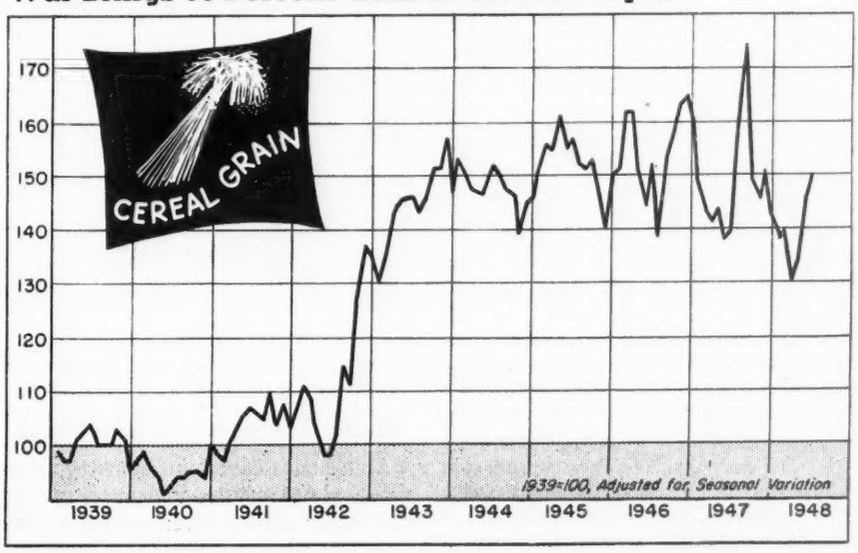
Bakers Experience Long-Time Boom



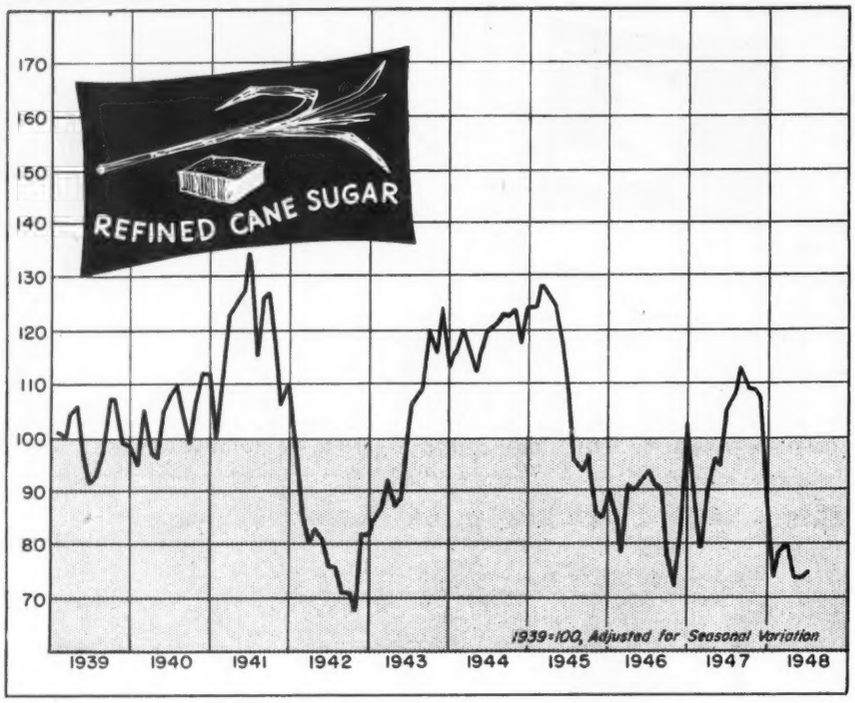
Flour Output Fluctuates at 130 Percent Level



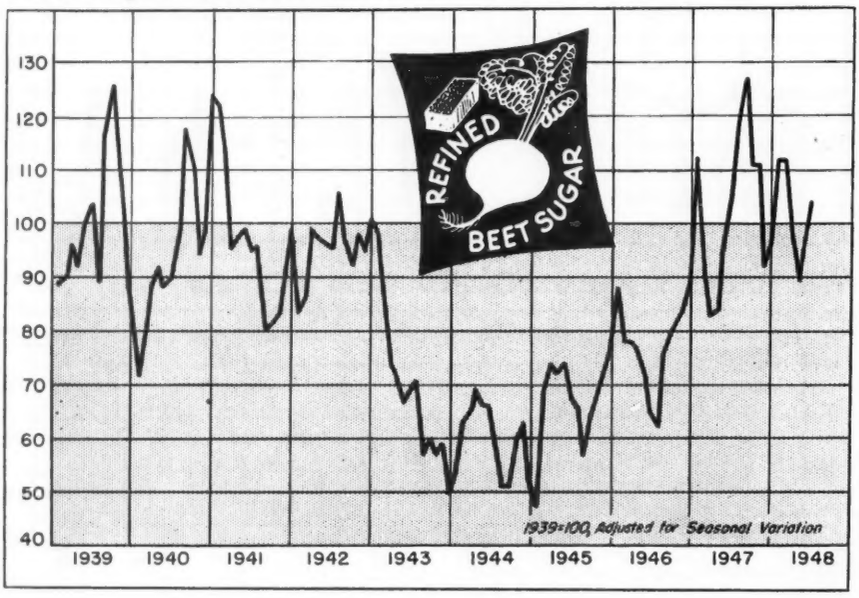
War Brings 50 Percent Gain in Cereal Output



Cane Sugar Has Ups and Downs



Beet Sugar Hits Wartime Skids and Recovers



ployment statistics are worked up on a nationwide basis and are a much sounder base than the fragmentary production figures that are available in our range of commodities.

2. The entire processing of a product is covered—but there is no multiple counting. Flour, for instance, has not been counted several times as it passed from grain, through milling to bread.
3. Using employment figures adjusted for the average number of hours worked in a week, crop exports are eliminated. So is the disappearance of foods at different levels of the processing system. The number of workers and the amount of time they work automatically compensates for most of the disappearance of foods as they travel through the assorted stages of processing.

Shows Production at Last Stage

Man-hours cover the industry from the level nearest the consumer, so that our index shows what has been produced in foods for people to buy.

There is one hitch: The changing productivity of labor. As manufacturers improve their plant and equipment facilities, modernize their machinery, and develop improved processing technics, a man working an hour today should produce more—and better quality food—than he did ten years ago.

Productivity can be measured, although it is difficult to do. The Bureau of Labor Statistics is now working on extensive studies of changes in labor productivity during and since the war. We will publish the outcome of their work as it is released.

Slow Change

Difficult as labor productivity is to measure accurately, it changes very slowly. For the whole economy, it has been going up at a rate of about 3 percent a year. And in many food processing industries it has been changing at an even slower rate; in some industries it is going up at about 1 percent a year, and in other industries it is actually declining.

The margin of error is, therefore, very small. In industries in which productivity is going up at the rate of .1 percent a month, we would have to have an error of 1,000 percent to affect the index by as much as 1 percent. Since there are annual figures as checks, such an error should not occur.

Productivity Changes

Even so, productivity is an important consideration in developing a man-hours index. Since it is cumulative, unless it is included the index can become understated over a period of years. What has happened in labor productivity in some of the food industries since 1941 is noted in the following table:

	Percent Change 1941-1947 (except as noted)
Beet sugar refining	− 1
Cane sugar refining	−22
Canning and preserving	+ 4*
Condensed and evaporated milk	−17
Confectionery	− 3
Flour and other grain mill products	−14
Ice cream	+23
Malt liquors	−11

*Period 1941-1946

Since we could get a good indication of the trend of productivity in the food industries and since man-hours offered us so many advantages, we decided to use that as a base for our yardstick of production.

The Index is put together by adjusting Bureau of Labor Statistics employment figures for each month by the average weekly number of hours worked. This gives us a measure of the activity in that month, in terms of man-hours, and takes into account changes in the amount of time workers are on the job, in instances when employment figures themselves might show no change.

Butter, Margarine Exceptions

Man-hours constitute the base for all commodities in our Index except two, butter and margarine. These indexes are based on production figures converted to man-hours, as reliable employment figures and number of hours

worked do not exist for the period of time that had to be covered for the purposes of this Index.

We then adjusted man-hour figures for each commodity for seasonal changes. Since these changes are continually shifting, this is a highly refined statistical maneuver. In essence, it is done by looking at the trends in each branch of the industry and changing the seasonal adjustment factors as the trend shifts in any one of them.

Patterns Always Changing

The margin for error here is also very small from one month to the next or one year to another. For the seasonal adjustment factors seldom shift more than ½ percent in any one month, from year to year. However, since these shifts are continuing from year to year, unless the correction is made annually, the error would accumulate over the years and distort the index.

The seasonally adjusted man-hours are then adjusted for changes in productivity. Although we have annual data on productivity shifts to go by, there are no monthly figures. What we have done is to convert the annual rate of change to a monthly change and apply this shift to the man-hour data. As pointed out earlier, the possible error is very small in a short period of time.

1939=100

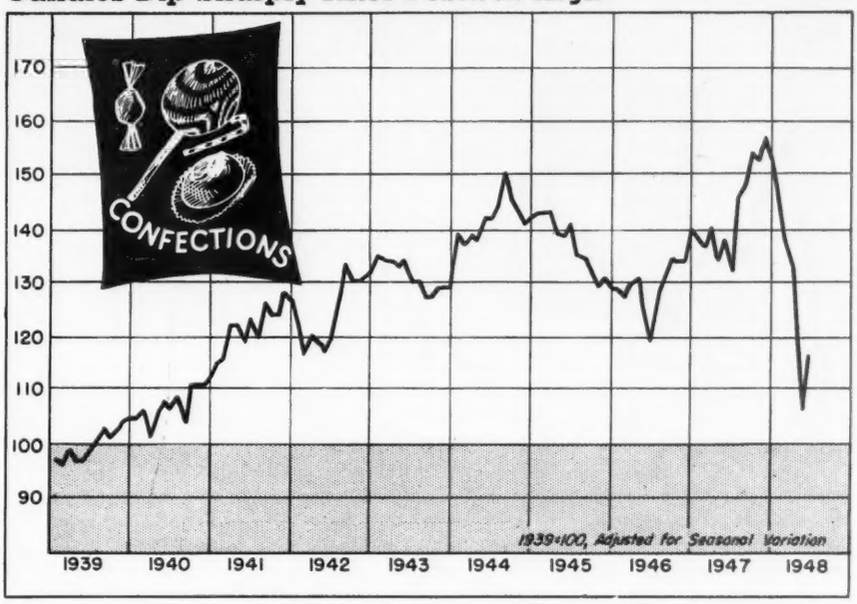
Having adjusted our man-hours for both seasonal and productivity changes, we are ready to convert them into an index. Index numbers measure percentage changes from a base period, so the next thing to do was to select a year to use as a base. We decided to use 1939, since a Census of Manufactures was taken for that year, and the employment statistics are, therefore, accurate. A war year would not make a good base because there were too many dislocations in the economy; and a postwar year is too soon to determine whether things are "normal" yet. The last "normal" year before the war was 1939; it is neither too near nor too far away.

Each of our indexes is on the 1939=100 base. The index numbers show percent change from 1939, so that an index number of 150 means that production is up 50 percent since 1939—or that it is 150 percent of 1939 average.

Self Adjusting

The total food Index is made up by adding together the man-hours (after the seasonal and productivity adjustments have been made) for each of the components. It is self-weighting; there is no statistical adjustment here.

Candies Dip Sharply After Postwar High



The amount of processing done in each industry and the relative importance of each industry in the total food picture is reflected in the employment and number of hours worked. Summing the man-hours and converting them to an index based on 1939 gives us a measure of total food processing activity adjusted for both seasonal and labor productivity changes.

This method of weighting means that the Index automatically keeps up with changes in processing. As processing technics develop man-hours will take into account these changes and adjust the weights accordingly. A clue to how this works can be seen in the relative importance of the components in 1939 and 1947 noted in the table below.

	Percent of total Index 1939	1947
Meat Packing	18.7	17.2
Condensed Milk	1.7	2.2
Ice Cream	3.0	4.3
Flour	4.1	3.4
Cereal	1.3	1.3
Baking	28.6	25.6
Cane Sugar	2.2	1.3
Beet Sugar	1.6	1.3
Confectionery	7.2	6.9
Beverages	3.7	3.0
Malt Liquors	5.7	5.7
Canning, preserving	18.1	25.0
Butter	3.5	1.8
Margarine	.6	1.0
Total	100.0	100.0

Comparisons Revealing

Charts show the relationship between overall production and output in 14 selected branches of the food industry

A GLANCE at the current standing of the comprehensive Index and at the standings of the 14 major branches of the industry shows why the indexes on the branches are valuable in interpreting important trends in the industry.

The comprehensive figure is a summary of general changes in the food industries. But, of course, any manufacturer wants to know how his own branch is doing—and that may be going in an entirely different direction from that of the industry as a whole.

Wide Differences

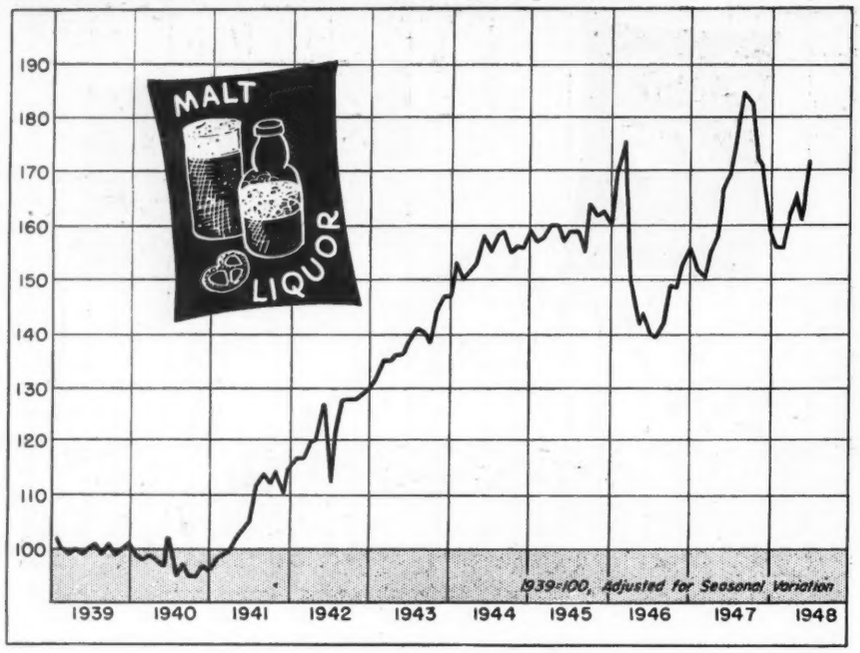
A single branch illustrates this graphically. Butter production this summer is only about 62 percent of what it was in 1939. The food industry as a whole has increased production by 46 percent in the 10-year period, but butter production has fallen by more than one-third. Other milk products—such as condensed milk and ice cream—have gained two-thirds or more in the period, but butter production is down. Despite—or possibly because of—the housewife's complaints of high butter prices, it is more profitable for the industry to turn milk into other products.

Index Records Progress

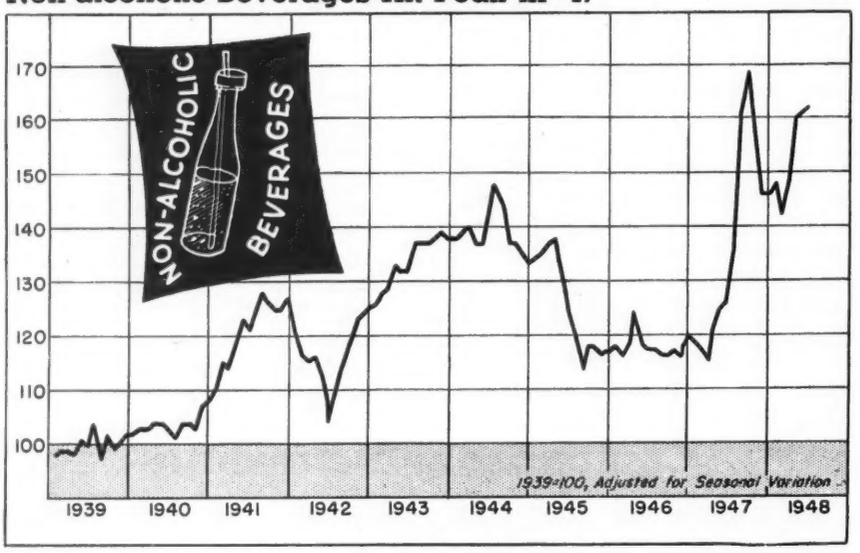
The comprehensive Index is a good summary record of the food industry's progress in the war and postwar years. At the beginning of 1939, the Index stood at 97. It inched upward above the 100 line in mid-1939, and moved on upward slowly to reach 105 at the end of 1940.

Then the Index leaped upward in each of the war years, setting new

Beer and Ale Fluctuate After Steady Climb



Non-alcoholic Beverages Hit Peak in '47



production records each year as demand for food grew. In 1941 it jumped a full 15 points—to hit 122 at the end of the year.

Bumper crops and growing demand added impetus to the upward movement. At the end of 1942 the Index reached 134, by year's end in 1943 it was at 140.

All-Time High

By late 1944, food production was leveling off. After reaching a wartime peak in mid-summer, the Index dropped back to a point slightly above 140. Both 1945 and 1946 were marked by wide fluctuations. Summer of each year saw the Index dropping a full 10 points in two or three months, then recovering to about the 140 level. Late 1946, however, saw another jump. The Index reached 146. Then the early months of 1947 saw it falling off, but it recovered to reach 148 in August, 1947, a new peak and the all-time high.

This year has seen a marked dip. The Index dropped to 133 in April. Since then it has been recovering, however, and it is now tentatively set at 146 for July. With 1948 grain crops reaching record size, the Index may well show new records this fall.

Most of the industry's 14 major branches covered by separate indexes show a similar sweeping gain in production in the war years. Meat packing, for example, reached its peak production in early 1944. From a level of 95 when 1939 opened, it advanced steadily to a top of 170. Then it fell more or less steadily until mid-1946, when it tilted abruptly downward to hit a low of 68. 1947 saw it fluctuate through a range of from 127 to slightly above 160. Strikes this year pulled the industry's output down again, but not to the 1946 low. Last May saw production at about 110—10 percent above 1939 and well above the 1946 low, even though it was a major drop from the 1947 average.

Only two of the 14 branches are now below their 1939 production levels. Butter, which has lost most, is at 62 percent of 1939 and cane sugar refining is at 75 percent.

Butter and Margarine

Butter is evidently losing ground to other products made from milk. And it is losing rather spectacularly in comparison to the growth in margarine production. Food Industries Index shows that margarine production is now at 344—which means that the increase in margarine production since 1939 is almost two and one-half times the total 1939 production.

Another indication of the changing importance of the two bread-spreads is their relative weight in the Index. In 1939 the production of butter made up 3.5 percent of total food industry activity. Today it is down to 1.8 percent. Margarine, meanwhile, has moved up from .6 percent to an even 1 percent.

Margarine, too, has gained more spectacularly than has any other major branch of the food industry covered by the Index. Ice cream, at 177, shows the second largest gain in production since 1939. Malt liquors, at 172, condensed milk at 168, and beverages at 162 follow the leaders in that order.

The difference in the movement of butter and margarine shows why the individual manufacturer needs to know both how his branch of the industry is doing and how the industry overall is progressing.

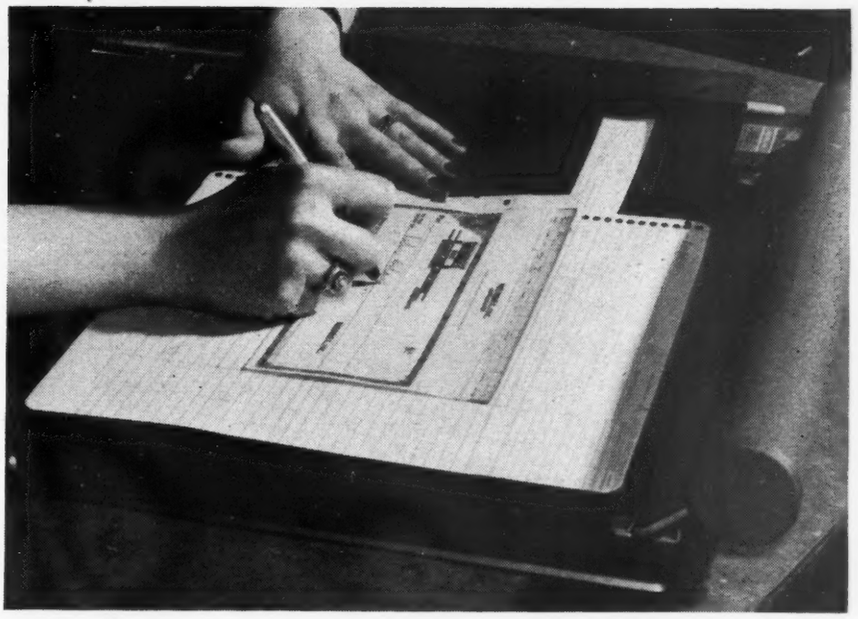
It is not enough for him to know that overall production in the industry is going upward sharply now—or even that an important section, such as the dairy industry, has increased production. While butter is down, for example, condensed milk producers are turning out 168 percent of their 1939 output and ice cream is at 177 percent of 1939.

Grains and Baking

Similarly, while bakers have moved production up steadily to reach 145 percent of 1939, flour production is at 136 currently, and cereals are at 150. The differences are too great to allow one manufacturer to guess the trend in his branch of the industry by watching what is happening in another.

In short, important as is the comprehensive Index as a record of the progress of the industry as a whole, Food Industries expects that the 14 indexes on the industry's branches will be even more useful to the food manufacturer.

Ready made forms and a compact machine which is easily handled simplify record keeping and quickly relieve those headaches suffered in . . .



Computing Checks for the Payroll

AT first glance, the business of check writing and payroll preparation seems like a comparatively simple and safe operation, particularly when judged from the standpoint of an individual. When examined from the perspective of a firm employing hundreds or thousands of people, however, it is easy to see how readily it can get out of control.

That was the situation at Merkel, Inc., New York meat-packing house, at the beginning of World War II. The increasing demands of new government regulations on social security, wage, hour, and other payroll information suddenly made the firm's disbursing problem a gigantic one. With an average of 550 employees, Merkel, Inc., found that no longer could two clerks handle the payroll. Government requirements stipulated, among other things, that complete earning data be maintained, and that employees be provided with statements of their pay check computations.

Multiple Entries

From seven to eleven weekly entries had to be made for each employee. These entries recorded overtime hours, union dues and laundry fees, and computed gross pay for social security. Altogether, this made a total of some 15,000 entries per week. In addition, awkward handling and signing procedures were taking hours of valuable time from the work days of department heads.

A. G. Mauer, Merkel's treasurer, turned to machines for a possible solution to his problems. He contacted The Todd Co., Rochester, N. Y., to see if it were possible to install a payroll system that would not only fill the bill from an efficiency standpoint—but would also entail a light machine investment. In other words, he wanted economy and protection, along with absolute payroll control and a maximum of employee convenience.

Simple System

Todd experts suggested the Form-Master system of payroll preparation. Adaptable for all types of business, this system centers about the Form-Master 64—a light, uncomplicated machine that requires very little desk space and that can be stored conveniently when not in use.

At Merkel, all main office employees, except executives and office assistants, are required to indicate their working time on time clock cards placed at plant entrances, and to provide an accurate record of regular and overtime hours worked. The executives and office help, who are on a weekly basis, record their working hours on individual cards, to assure conformity with the wage-hour law.

Each employee is assigned a number, serially, by department and by rate of pay. Addressograph plates are then made up for each with the employee's name, social security number and rate of pay, and filed by department in numerical order.

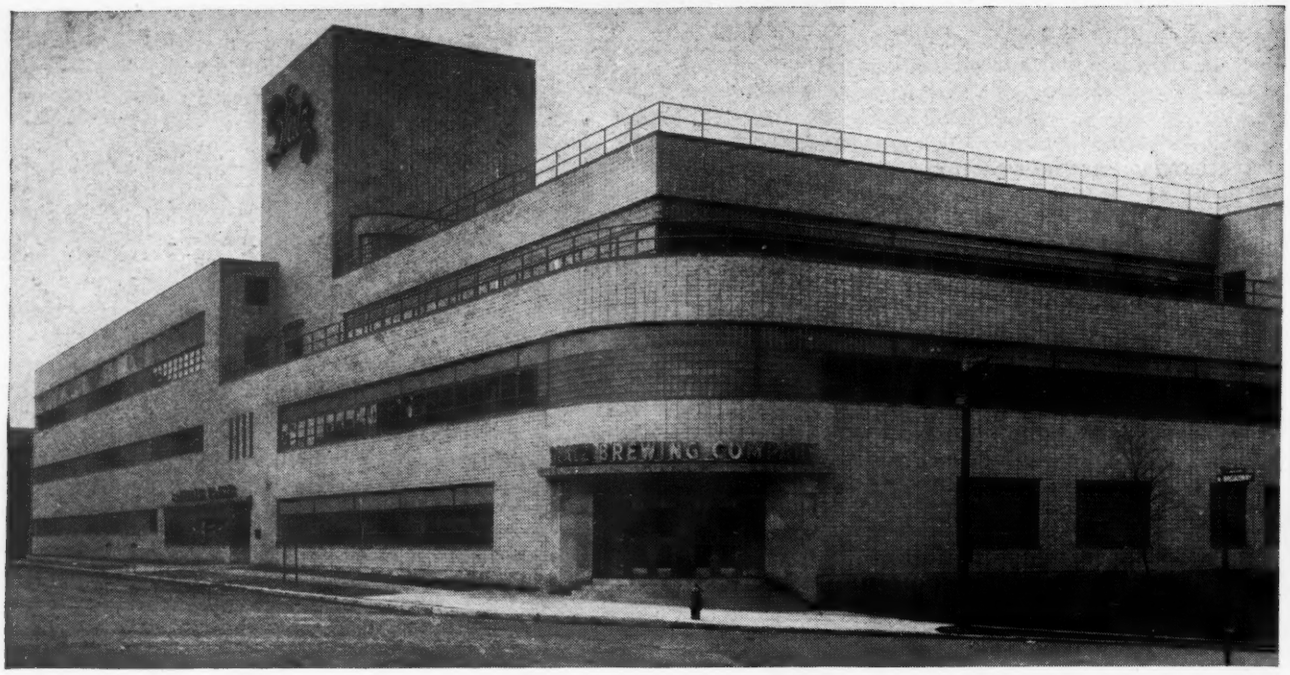
Three preliminary steps are necessary before the Form-Master 64 takes over: 1. Running the payroll statements through the Addressograph machine constitutes the initial phase of the preparation of the weekly pay checks. This is done after all corrections have been made in the plate file for absences, transfers, or other reasons. 2. The serially-numbered payroll checks are then taken from their locked container and run through the Addressograph twice—once for writing the stubs and once for writing the checks. 3. The individual earnings records, which had also been filed by department, are then brought from the earnings file, to avoid a last-minute rush after the time cards, completely filled out, have been delivered to the paymaster.

Ready to Go

Since weekly rates are known and there is no provision for overtime, preparation of checks for all salaried personnel comes first. Then on Monday mornings, Merkel time cards for hourly rate employees are collected from each of the firm's 28 departments, and quickly set in correct numerical order. Identical as to name and number with the payroll statements, earnings records and checks, these cards go to a payroll department clerk, who adds and computes normal and overtime working hours on a daily and weekly basis and enters them in the spaces provided on the time cards. All footings are then checked in the firm's accounting division before the cards are turned over to a second clerk, who operates the Form-Master.

The clerk inserts the payroll state-

(*Continued on page 217*)



New $6,000,000 Blatz Showplace Is . . .

Last Word in Bottling Plants

An outstanding example of advanced food plant engineering, new works doubles output per man-hour by use of high-capacity equipment, continuous straight-line production, and extremely efficient conveyor system

By F. K. LAWLER
Executive Editor
"Food Industries"

MORE than twice the production with about the same number of workers! That is the achievement of advanced food plant engineering in the new $6,000,000 bottling plant of Blatz Brewing Co.

But it is not the only achievement. This highly sanitary plant with its modern equipment protects quality. Its excellent working conditions are pleasing to employees. And the show-place building design and production layout of the down-town Milwaukee structure make it an effective booster of public relations.

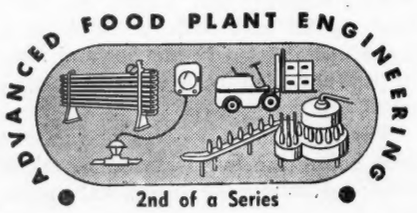
Each of the seven bottling lines in this plant will average 40 barrels an hour. Each of the two can lines, 55 barrels. Which add up to the sizable total of 390 barrels every 60 minutes. Output of the old bottling works, which this one replaces, amounted to only 173 barrels an hour.

With straight-line production and completely conveyorized materials-handling, this bottling operation comes about as near to being continuous as it is possible for such an operation to be.

Covering almost an entire city block, the attractive building which houses the plant coordinates architectural and engineering features. That is to say, it was designed to permit efficient production layout, as well as to have structural distinction. Three stories high on one end and four on the other, the building has a basement under all and provides 300,000 sq. ft. of floor space. It is of steel-frame construction with reinforced concrete floors.

Unusual Features

The attractive exterior consists of manganese spot gray tile and glass block. Built for sanitation as well as eye-appeal, the interior walls are of buff salt-glazed tile, while the processing floor is easily cleaned red quarry tile sloped for quick drainage. As a finishing touch, the roof-supporting columns on the bottling floor are covered with stainless steel.



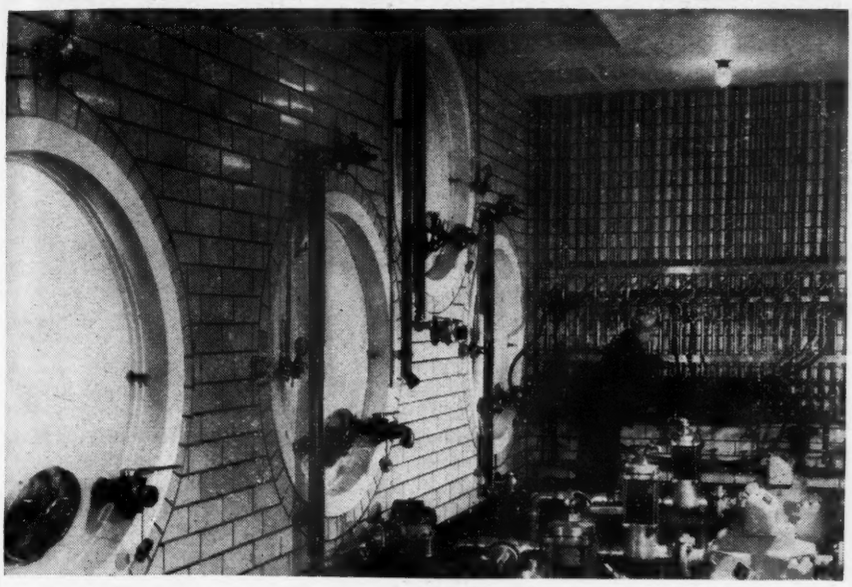
To provide strong daylighting and good ventilation, the bottling room is on the top floor. It measures 258x208 ft., and the ceiling is 23 ft. high to make a spacious room. Continuous ventilating skylights cover the entire area, and there is a band of glass block and windows around the room.

But light in the wavelength range harmful to beer is excluded by actinic glass. And cleaning of the large expanse of glass is made easy by a traveling bridge in each skylight. Twelve push-button controlled electric motors operate the ventilators.

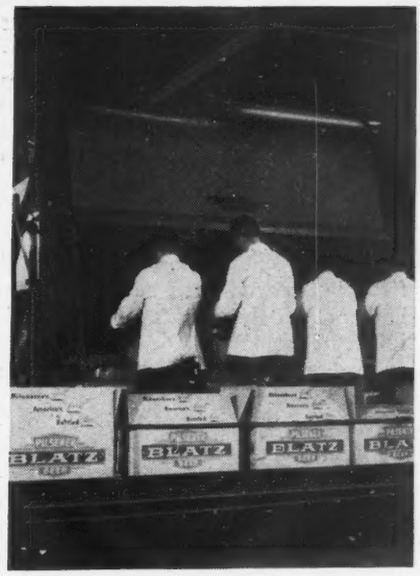
No overhead piping detracts from the appearance of this room nor collects unsanitary dust—except for the essential sprinkler piping. The engineers located the piping on the ceiling of the floor below, or ran it along the machinery or conveyor supports. The stainless steel enclosures on the columns conceal vertical piping.

Extra space on this floor is provided by balconies. One accommodates the can unscramblers and rinsers. Another at the opposite end provides the empty

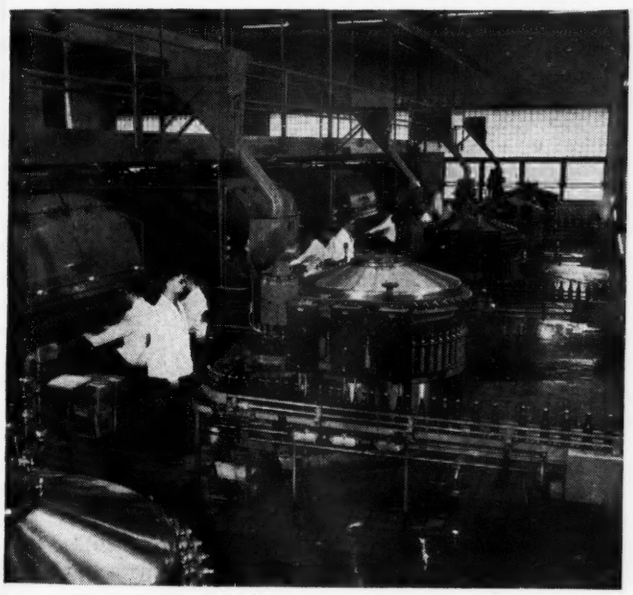
From Huge Glass-Lined Tanks Into Carefully Sterilized Bottles or Cans



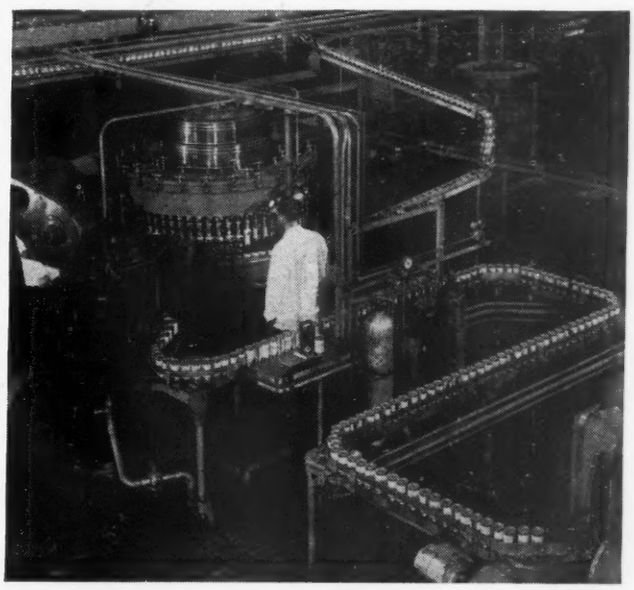
1. Beer to fill bottles and cans is stored in 30 glass-lined steel tanks in "government cellar." Ends of four of the huge storage tanks may be seen here in left wall.



2. Soakers remove labels from returned bottles, begin the sterilizing process.



3. Sterilized bottles are inspected, travel through 50-spout fillers, are capped, and then conveyed into pasteurizers.



4. Two can-filling lines handle 55 barrels of beer each per hour. The filled cans pass check-weigher, go to pasteurizers.

case storage from which cases are fed by chutes to the highly efficient carton packers.

The basement is a storage area for empty cases and cartons, while the first and second floors are allocated to the storage of packaged beer. These elevations are serviced by an extensive network of conveyors leading to and from loading platforms, storage areas and the filling room.

Beer Piped From Brewhouse

Conveyed from the brewhouse across the street through pipes under CO_2 pressure, the beer to be bottled is stored in 30 glass-lined steel tanks, each 9 ft. in diameter and 26 ft. long. The combined capacity of the tanks in this "government cellar" is 10,000 barrels of beer. The tanks are on the second floor in a 61x143-ft. refrigerated room lined with 4 in. of cork.

Bottles, Cans and Cartons

Empty bottles, cans and cartons are brought in by truck and taken by belt and roller conveyors to production or storage areas. As bottles are needed for filling, they are conveyed from storage to the soakers on the second floor, there being a soaker for each line.

It is for reasons of sanitation that the soakers are one floor below the bottling room. The greatest amount of waste and breakage are encountered at the soakers. And in the Blatz plant provisions are made for efficiently handling the litter. Broken glass is stored in hoppers which dump directly into a truck. Labels and other trash are disposed of as fast as they accumulate via a chute to an incinerator. Old cartons in which empty bottles are brought to the soakers are tossed conveniently onto an overhead belt conveyor which takes them to two balers on the floor below. After baling, the old cartons are carried on an overhead monorail to the shipping dock.

New cans are delivered in Blatz-labeled cartons to which they are returned after filling and closing. The cans are dumped onto an unscrambler on the third floor balcony, then conveyed to the fillers below. Cartons move by conveyor to the carton-filling machines. When a jam occurs on the conveyor transporting cartons and cans on the balcony, an electric eye

and relay stop the conveyor motor.

Cartons for the bottled beer are set up on the second floor. They are inverted over forms on a conveyor, automatically sealed at the bottom, then automatically upset from the forms onto another conveyor which takes them to storage near the carton filler.

Straight-Line Operations

Empty bottles automatically travel from the second-floor soakers to the level above. Then they are sterilized, inspected, filled by 50-spout machines and capped. Conveyors then carry the bottles to a spray-type pasteurizer, where they are preheated, "held," precooled, and cooled under automatic control as they move along on a "walking beam" conveyor.

These pasteurizers are engineered for performance, and they are easily accessible in the event of trouble. The entire top of each is composed of a series of plates with handles so that they may be lifted off easily.

Leaving the pasteurizers, the bottles pass an inspection light, move on to the labelers, then are conveyed to machines which drop them 24 at a time into cartons. The man who operates the carton packer turns out 700 to 750 cases an hour. He sits comfortably at his work, as do most of the employees in the plant, and is protected against any bottle breakage by a glass shield, through which he views operations.

Each line is arranged for straight flow. And each machine in the line has been selected to provide ample capacity for the output of the machine ahead of it.

For example: Four labelers are provided, and any three of these could handle the production. The fourth is insurance against "down time" for any changes. Different sizes of containers can be handled on most of the lines. Quick changeover of machines permits varying market demands to be met readily.

The two can lines parallel the seven bottle lines. Empty lithographed cans are supplied to the 60-spout fillers by conveyors which lead from the unscramblers on the balcony. The fillers utilize the counter-pressure principle to minimize air content of the packaged product and the deteriorating effects of oxygen. After closing, some of the cans are check-weighed for fill, and the containers on each line pass through a pasteurizer and to a casing machine which, as stated, puts them back into the cartons in which they were shipped to the plant by the can manufacturer.

After casing, the bottle and can cartons are automatically sealed and conveyed to the storage or to the shipping platform. They move along a three-tier conveyor on the first floor, some being shunted by an operator onto branch conveyors to make up specific shipments.

5. Eight of the nine spray-type pasteurizers which preheat, "hold," precool, and cool bottles and cans of beer. Here, control instruments regulate temperatures.

Quick Loading, Unloading

The conveyor lines lead to the loading dock—one of the outstanding features of the plant. Completely enclosed, this dock accommodates 16 transport trucks simultaneously. The conveyor system is designed to permit trucks to discharge loads of empty bottles and, by a flip of a switch, immediately begin loading full cartons without changing location.

Projectoveyors are used in this unloading-loading operation. These are retractable belt conveyors on lightweight aluminum rollers and frames. They are mounted inside the wall of the building and can be projected into the trucks and then withdrawn. They are cantilevered at the inside, sliding end, are unsupported at the outer end. The inside ends of these Projectoveyors tie in directly with the conveyor lines in the building.

Conveyor Efficiency

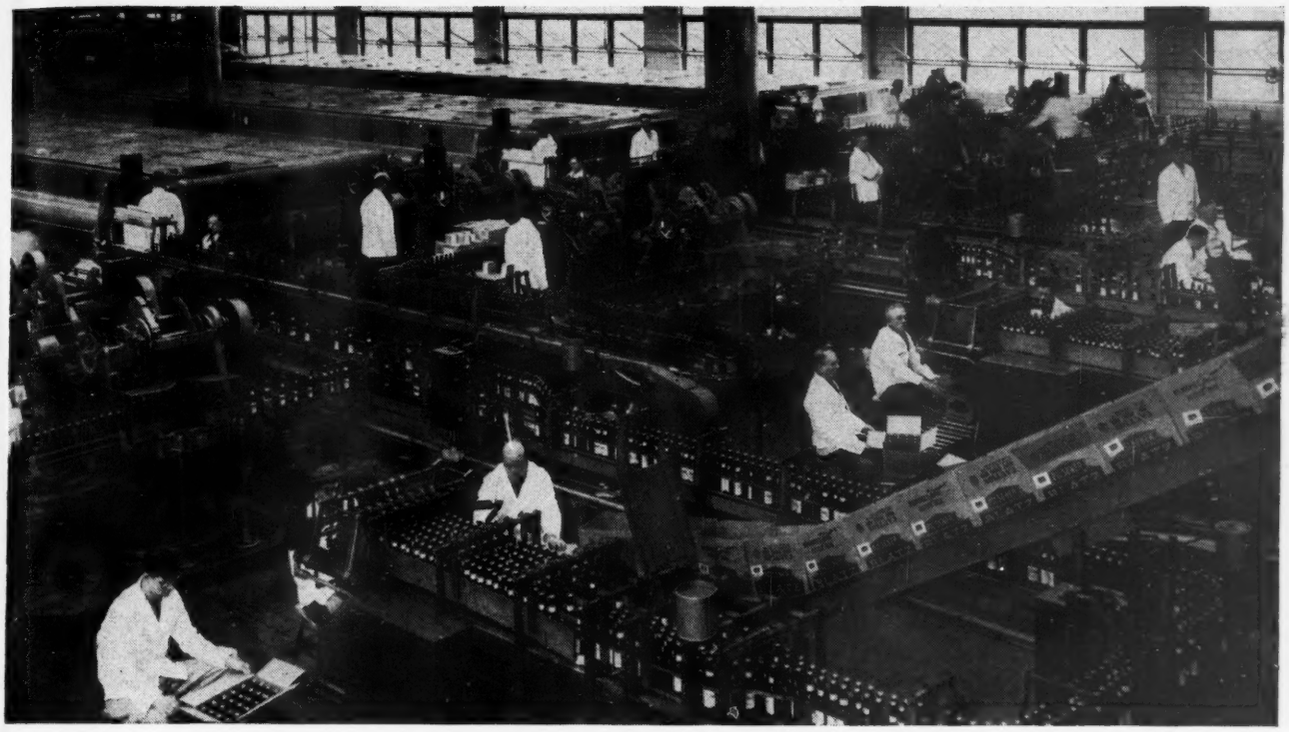
Shipping and receiving portions of the conveyors are in duplicate. This provides a continuous flow in one direction and allows a high degree of selection. Containers as received may proceed through the plant for immediate reshipment, or they may be diverted to full or empty storage, depending on the season of the year or sales requirements. Everything moves by conveyor from beginning to end. There is practically no manual handling.

The conveyor system totals approximately 15,000 ft., of which 7,500 ft. is belt conveyor and the remainder largely live roller and gravity roller conveyor. The free power of the gravity roller is utilized where it is available and where it is not necessary to have a level line for working purposes. Live rollers are employed where the lines must be kept level and where cases are delivered or are shuffled back and forth on the conveyor during the necessary operations. Belt conveyors do all the direct straight-away conveying, where no operations are done in process or where the cases must be carried up inclines from one floor to another.

To provide a maximum storage of cases of empties on the conveyor prior to washing operations, five belt conveyors are decked one above the other. These are fed by an inclined pivoted conveyor, and the various decks discharge directly into individual soakers.

Another unusual feature of the system is the outgoing lines from the different casing machines. Non-interference devices permit the flow of cartons from several casers to one conveyor line.

To speed the filling of the crown hoppers for the bottle cappers, crowns are conveyed by monorail from storage and dumped into chutes mounted on an elevated walkway near the fillers. Another monorail—a heavy-duty one—accommodates an electric hoist capable of picking up an entire machine and transporting it to the repair shop. A spare machine is placed in the bottling line to keep "down time" to a mimimum.



6. On these comprehensive lines—seen to advantage in overall view from above—pasteurized bottles of beer are first inspected, next labeled, and finally cased. Conveyors move bottles and cartons rapidly. Casing machine fills 700 or more cartons an hour.

A wide range of facilities is provided in the nonproductive areas of the plant. Lockers and wash rooms are adjacent to—but not directly in—the production area. First aid and medical facilities are in a well-equipped division readily accessible from the operating area. An employees lunch room, a modern laboratory and offices for the bottling operations are all located adjacent to the operating floors. Even the roof areas have been developed so that they are available for recreation.

Not only is the new Blatz bottling plant a showplace, but it is equipped for the entertainment of visitors and for use by civic groups. It is, in fact, designed as an implement for building and maintaining good public relations.

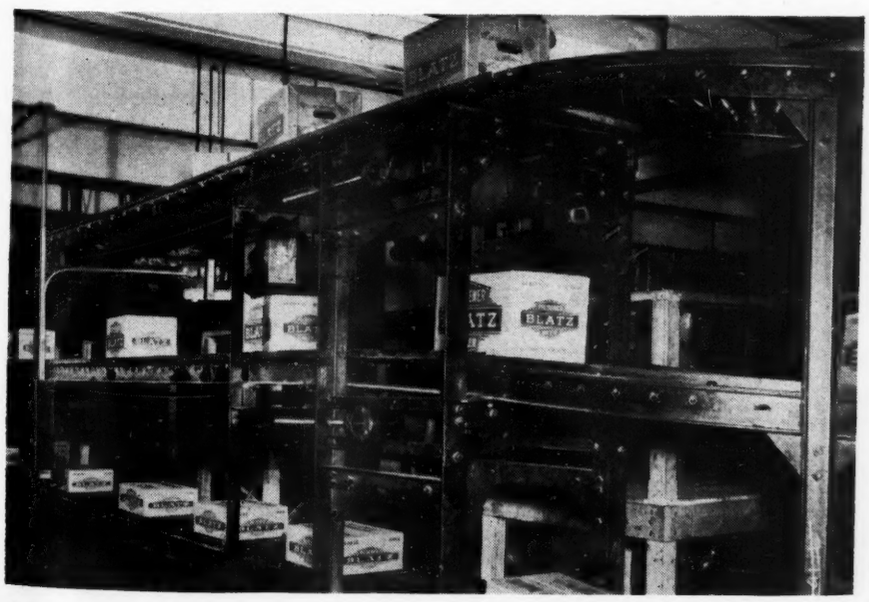
Hospitality a Feature

Visitors assemble in a large modern foyer and are taken on a tour of the plant. A balcony extending the length of the bottling floor permits them to view all operations on the nine production lines. After seeing the beer bottled, the visitors have an opportunity to sample it in an ultra-modern horse-shoe bar.

Civic organizations, as well as employees, can stage affairs in an elaborately appointed auditorium seating more than 300. Adjoining are a guest bar, two service bars, a complete kitchen in stainless steel, and private conference rooms. Seating in the auditorium is removable to provide accommodation there for dances or dinners.

Air conditioning provides year-'round comfort in the visitors section, locker rooms, lunch room, offices and laboratories.

The highly efficient new bottling plant is but the first unit to be completed in a $16,000,000 Blatz expansion program. Among other facilities to be erected are a stock house, new office building, grain elevators, and freight loading docks.



7. As the sealed cartons of beer move along this three-tier conveyor, they can be selectively diverted onto branch conveyors as shipments for specific localities.

8. Projectoveyors load cartons directly into trucks; reverse for unloading.

It's Top Management's Job to Launch . . .

Better Human Relations

Executive orders won't relieve friction in a machine—you must know what stresses occur among the working parts. The same is true of your human working force

By F. ALEXANDER MAGOUN and JAMES MORRIS SHIPTON,
Director and Staff Member, Human Relations, Inc., Boston

WHEN a well-established New England food factory planned to modernize its equipment after the war, the plant manager recognized that he had an emotional as well as a mechanical problem. In addition to the usual industrial engineer, he hired a consultant to study the emotional aspects of the modernization plan and to prepare the executive staff for steering the employees past any possible misunderstandings.

Form Group

How this was done is a story in itself. The result was so successful that out of this and several similar experiences came the organization of Human Relations, Inc., of Boston. This group was organized for the purpose of serving business and industry by seeking sound solutions to the emotional problems that always beset human group endeavors. In addition to the consulting service offered, a seminar was undertaken, in the winter of 1947, in which a carefully selected group from top management spent eight 5-hr. Saturday sessions studying "Human Behavior as a Business Problem."

The most confusing and yet important principle to come out of the seminar was the predominance of the way in which behavior is controlled by the subconscious mind. All of us understand so little about the ways in which we behave and the reasons why we do what we do. Management can gain much by realizing that there are almost always two reasons for the things we do: The reason we believe and the real reason.

The corollaries of this truth led deep into many industrial situations. Understanding it enabled the seminar participants to grasp the real issues of a specific strike where management and labor had spent hours haggling over the superficial issues of wages and job assignments. The actual cause of the trouble was the subconscious, but lingering emotional pressure of a previous strike in the same plant. In that strike another management had smashed the old union by tyrannical methods.

Needed Revenge

Now there was a new management and a new union, but down below the level of conscious awareness the employees wanted revenge for the humiliation of the past defeat, a chance to test the effectiveness of the new union, and some means of finding out whether the new management was as fair as it pretended to be. A strike would serve nicely for all three purposes.

How necessary for management to understand what the issues really were! For one thing, it clearly would be foolish to try to settle the strike until the employees had a valid sense of revenge. Also any high-handed impatience by management would be fatal to management's recovery of employee confidence.

Through expert advice, which

pointed out things of this kind, the company came out of the strike with the best industrial relations in its history.

In American industry much damage has been done by management endeavoring to "sell" its opinions to labor. Because management possesses the authority, it has concluded that it also possesses the competence. This is fundamentally what has been wrong with industrial relations.

Seek Principles

Executives do not order a machine to produce and, when the machine refuses to obey the order (as machines have a way of doing), post a notice to the effect that the machine must produce. Executives neither threaten the machine nor attempt to bribe it with the enticement of higher wages. They seek to understand the principles by which the machine operates and to obey them. Executives pay little attention to management's authority over the machine, and much attention to management's responsibility for producing the conditions under which the machine can work well. This, we must also do with men.

The great majority of top executives want to deal intelligently with human problems, if for no other reason than because it is good business. But lack of an understanding of the true issues, often hidden from the layman by deceptive surface conditions, has prevented many managements from reaching sound solutions to their human problems. Instead they have frequently settled for temporary expediencies, which eventually have proved unsatisfactory. Whenever the real trouble is not perceived, a real solution is not possible.

"Who? Me?"

Often the trouble lies in a lack of understanding of human beings on the part of the top executives themselves. Their response to such a suggestion is usually a startled, "Who? Me?" For although an executive will freely admit that he does not know how to carve a duck, or that he cannot make a hole-in-one, or that he is confused by European politics, it is a rare man indeed who will admit that he does not know all about human relations. On the foreman level he will usually favor training in the mysteries of why we behave the way we behave. But on the top level? How absurd!

Actually, as the seminar group eventually agreed, the place to begin any program of education in human relations is at the top. Can the foreman be expected to take seriously something he knows top management is ignoring? Often the foreman's reaction is, "The brass hats need this more than I do. And frequently he is right. There is no such thing as a good crew or a bad crew; there are only good captains and bad captains.

Supervisors Help

Given the opportunity, without hokum or implied criticism, line supervision will, of its own accord, ask for authoritative information on why people behave the way they do. This is particularly true when the foremen know that top management has been engaged in such study. Last fall, General Foods conducted a survey to find out what instruction the supervisory personnel of its Walter Baker Chocolate & Cocoa Division, Dorchester, Mass., would most welcome as helpful in carrying out their jobs. (This, incidentally, represents notable progress beyond the traditional management policy of teaching the foremen what the top executives think they ought to be taught.) Every one of the first ten subjects selected by the foremen—in order of importance to them—had to do with people; not with machinery, or products, or processes. At the head of the list was a unanimous request for information on "What Makes People Tick?"

Adapts Program

The Walter Baker management responded promptly. Plant Manager James F. Cyphers, who had been one of the 14 participants in the first seminar conducted by Human Relations, Inc., divided his supervisory staff into three groups of 16 men each. During the previous summer he had worked with unremitting vigor to adapt the seminar material to the Walter Baker situation. He was not merely repeating what he had heard; he was presenting what he had thought through, and—more important still—felt through for himself.

As in the original seminar, interest came alive to such a degree that the discussion periods could not be broken off until after they had far exceeded the originally allotted time. Out of this instruction came a greatly improved understanding among all the men involved. Weeks later, foremen were still coming to Mr. Cyphers to discuss problems in human relations.

To date, three seminars for top executives have been held by Human Relations, Inc. Five companies sent representation to two of the second seminars. One company had men in all three.

Program Works

Each seminar group has spontaneously asked that a reunion of their membership be held, after sufficient time has elapsed, in order to appraise the subsequent results of their new human relations experience. The first such reunion has been held, and it was an exciting occasion, as man after man told his story. There were, of course, a few who benefited but little. Not every arrow hits.

But almost everyone learned, at least, the futility of seeking some handy set of rules, some magical formula, some ten commandments by which to handle people. While rules may be all right for the clerk, the plumber, and the night watchman, nothing less than the mastery of the fundamental principles of his profession is adequate for the engineer, physician—or the manager of men.

Those who profited most came out of the seminar with an increased understanding of themselves, which always inspires a better understanding of others. This knowledge of the laws governing human behavior—both one's own and that of one's associates—is the very keystone of capable management.

For all of us, then, there is food for thought in this question of professional competence in understanding people.

How Full-Time Jobs Pay Off

Reasonable assurance of a steady job at a decent rate of pay is, without question, the first step in bettering human relations. But fluctuating seasonal requirements in the food industry have too often proved a stumbling block to the realization of either goal. Until recently the employment of part-time, unskilled help to augment a full-time skeleton force has been regarded as the only solution to peak production. But the wisdom of this solution has been knocked into a cocked hat by several more imaginative food producers, who refused to be licked by nature's production cycle.

These producers—and their number is growing year-by-year—have contrived to spread production over a full time period by working out programs to meet each case. Where a more diversified output failed to wholly fill the bill, partial processing for storage and packing at a later time succeeded. Broader training of workers and larger warehousing have also contributed to these programs.

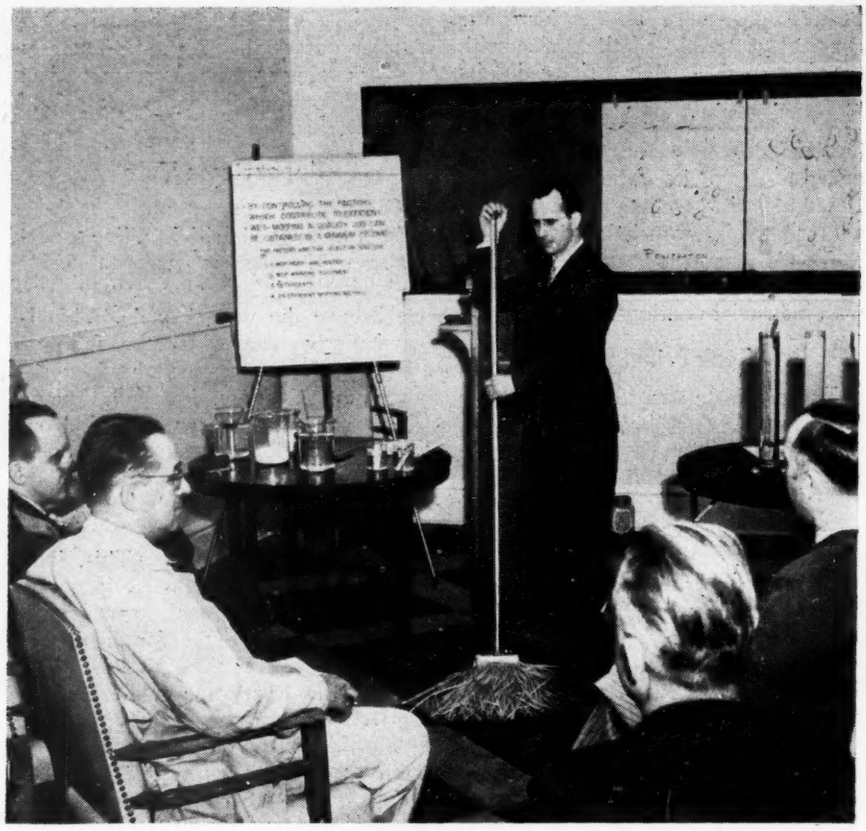
While no general measures can be offered for developing a full-time program, there does seem to be one essential that is common to all—determination to do the job. Where it has been done it has paid off in efficiency and good will that have been reflected in net income.—The Editors

Contest-Winning Article

FOOD INDUSTRIES is pleased to present this very practical feature—which won for Author A. L. Freeman the first prize of $100 in this magazine's recent prize article contest.

Sought were outstanding stories telling how specific food plants reduced operating costs by applying advanced methods.

Winner Freeman is seen in the first photo, as he demonstrates the correct stance with Post Cereal's new mop.



Long-Life "Pear"-Grip Mop Was Key

From Mop Bucket

How notable savings have been achieved through

By A. L. FREEMAN, Plant Sanitarian, Post Cereals Division, General Foods Corporation, Battle Creek, Mich.

OVER THE YEARS we, like most other companies in the food industry, have spent hundreds of thousands of dollars to keep our buildings clean—yet very little attention has been paid to the possibility of increasing the efficiency of this operation. Last fall we decided to do something.

In checking the cost of cleaning, we found that it comprised about 5 percent of our total labor bill. If we could reduce this to a figure of 4½ percent—without decreasing the general sanitation level—an important saving could be shown.

For most food industry operations, the cost of labor represents only about 35 percent of the total cost. In the specific cost of cleaning, however, labor accounts for 85 to 95 percent. It is easy to see, therefore, why a slight increase in efficiency can effect a substantial saving. Cleaning in most plants is assigned to untrained persons or to those for whom no other work is available at the moment. No thought is ordinarily given to the possibility of increasing productivity by training personnel and providing up-to-date equipment with which to do a better cleaning job at less cost.

Soap Studies

Our first investigations were in the field of wet mopping, since this was one of our most expensive cleaning procedures. First step was to study mopping compounds.

We had used, heretofore, a mixture of 100 lb. of soap flakes and 15 lb. of tri-sodium phosphate. This has been the old standby for a number of years. But at present, it costs about 27c. per lb., and in addition to being expensive, this mixture had left streaks and soap scum on our concrete floors, and, in general, did not produce good results.

After much trial and error, we finally settled on a synthetic detergent—an alkyl aryl sulfonate, which proved to be an excellent cleaner, with good penetration, suspension and rinsing qualities. It does not combine with the hardness in the water, and consequently leaves no scum or film on the floors. Its cost is a little more than 13c. per lb., and in actual use the expense runs only one-fourth as much as the former soap.

This seemed to take care of our quality problem, but it did little to increase the speed at which our moppers could comfortably work. So we turned next to a study of the efficiency of our mopping equipment.

Design Handle

We had read that a mop handle made of 1⅛ in. aluminum tubing, 5 ft. long, with a knob on the end, was the most efficient handle. Since we could find no company that sold such a handle, we built one for ourselves. The exact design of the knob posed a question, so we had several kinds made for the moppers to try out—including a baseball bat style, a round ball type, and a pear-

Power Scrubber Multiplied Efficiency

And Sweeper Promises Extra Savings

To Sanitation Bonanza

revolutionized cleaning program at Post Cereal's Battle Creek plant

shaped model. After several weeks trial, the moppers settled on the pear-shape as being the most comfortable.

Two of these handles were put into service and, after a few weeks, the production of the two moppers using them had risen about 15 percent.

Our next step was to study the types of mop heads. Those we had been using were standard 18-oz. cotton strand heads and cost about $1.00 each. They lasted 50 to 60 mopping hours.

New Mop Heads

We obtained for trial two new type mop heads. These were made of cotton strands coated with cellulose sponge. The cost is about $3.50 each. We found, however, that these lasted from eight to ten times as long as the cotton heads and would absorb a great deal more water.

With the combination of a proper detergent, new handle, and new mop head in operation, we sat back to await results. In about two weeks the productivity had increased 34 percent.

With this as a starter, we investigated the possibilities of machine mopping. The machine we picked for a trial is a self-propelled scrubber priced at about $1,700. The cleaning solution is fed to two 13-in.-dia. revolving brushes. At the back of the unit is a combination V-shaped squeegee and vacuum apparatus which picks up the dirty water in a separate tank.

We expected that it would take the operators three to six months to really become proficient with this machine, but time studies after only three weeks showed that the men were cleaning more than five times the area covered by hand moppers, and the quality of the work was excellent. Indications are that the machine will eventually make it possible to cover seven times the area-per-hour covered by the hand moppers. At the present rate, the machine will pay for itself in about six months.

We estimate that by application of the above improvements, approximately $10,000 will be saved in the next twelve months on mopping alone.

We are now beginning to investigate other possibilities of cutting cleaning costs—further mechanization, special scheduling of cleaning, and an effective employee training program. As for additional power units, we are now checking a mechanical sweeper which shows great promise for routine cleaning of some areas.

Plant Conferences

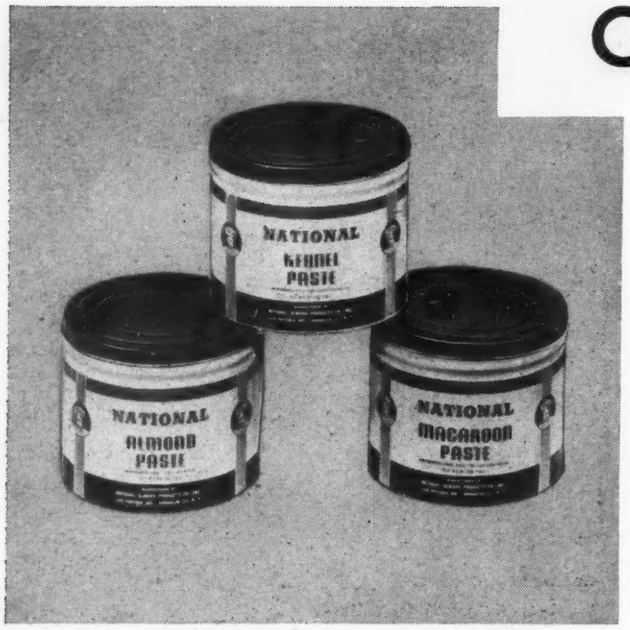
All sanitation supervisors of the General Foods Corp. plants recently attended to series of plant-sanitation conferences held at the Post Cereals Div. In our photos, these men are seen viewing demonstrations.

Included in the conferences were discussions of the Food, Drug & Cosmetic Act, wet and dry cleaning methods, cleaning agents, and rodent and insect elimination. We also considered the training of employees in the proper method of using cleaning equipment, and means of getting top employee cooperation in keeping our plants clean.

What we have done here is something that almost any food industry can do—if the proper approach is made.

Quality Nut Pastes

A Special F. I.



FINISHED PASTE in 25 lb. tins. It is also packaged in 5 and 60 lb. tins, and in 50 and 100 lb. wax-paper-lined boxes.

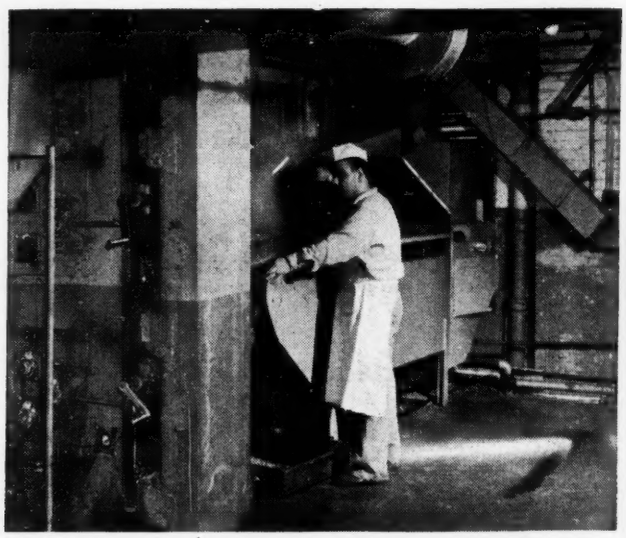
ADVANCED equipment and methods have both improved the quality of nut and pit pastes and speeded the operations in their manufacture at National Almond Products Co., Brooklyn.

The company is nearing the goal of making the entire process continuous, with many steps already on that basis. Remaining batch operations are so timed that the present production is a constant flow.

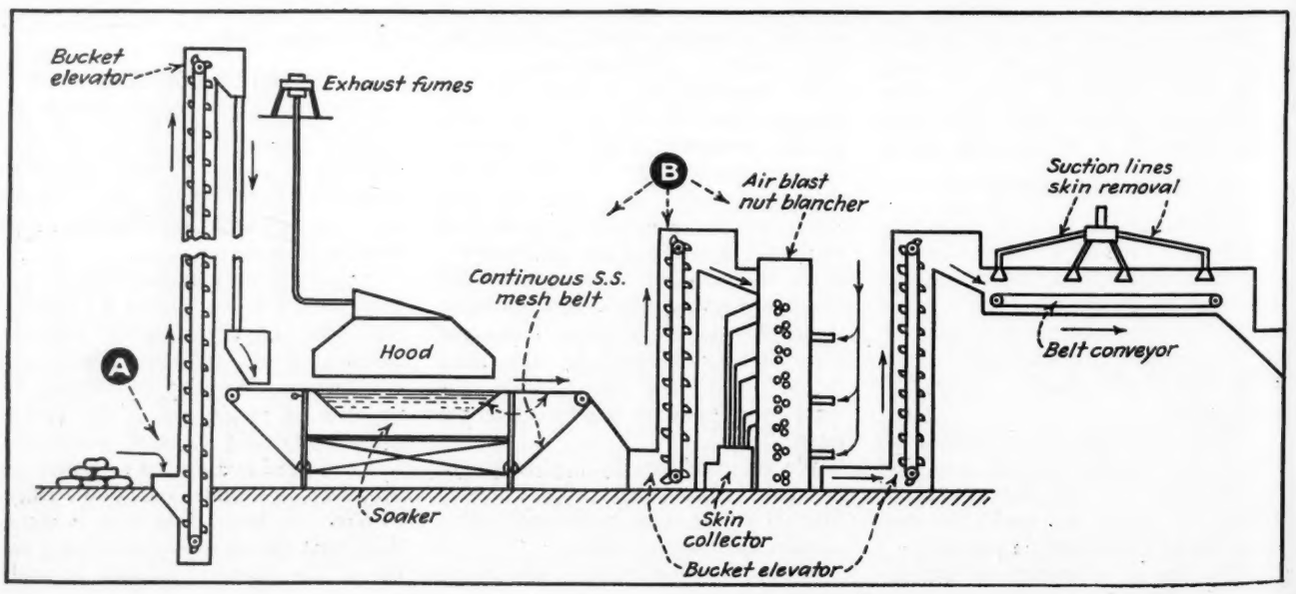
National's three pastes—almond, kernel and macaroon—are made, respectively, from almond nut meats, apricot pits, and a combination of the two, all with a sugar medium and added moisture.

First, nuts are dumped into a continuous-bucket elevator feeding a hot-bath soaker, where skins are softened. For removal of skins, nuts then travel to an air-blast blancher and next are conveyed in a suction-line-equipped trough.

A. **DUMPED** into a hopper feeding a continuous bucket elevator, the nuts are delivered to processing floor of plant.



B. **NUTS** travel on a stainless-steel mesh belt through hot water soaker—to soften skins prior to removal in blancher.



By Modern Means

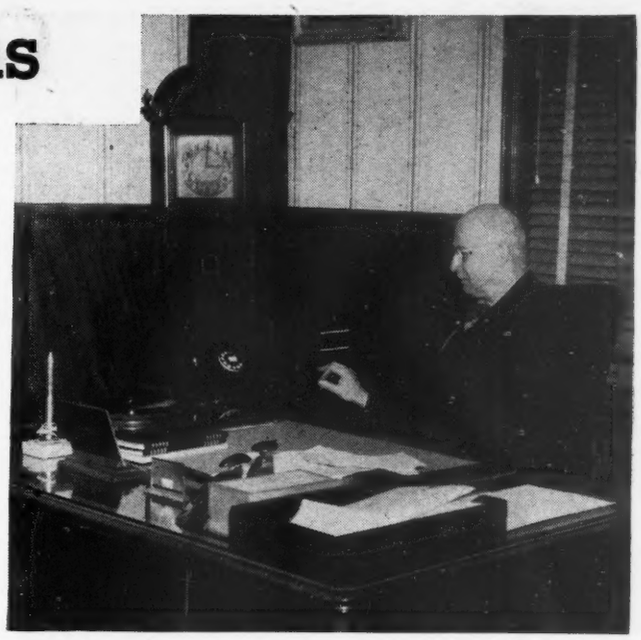
Picture Feature

The nuts finally fall on stainless steel inspection belts.

Prussic acid (HCN), occurring in the nuts and pits, is partially removed by the washes. After the nuts are dried in high-speed basket-type centrifugals, Fitzpatrick comminuting machines grind them into bits. The kettles remove remaining prussic acid fumes and reduce the bits to a paste of 11 percent moisture content. Pastes are packed direct from kettles and transferred to air conditioned storage.

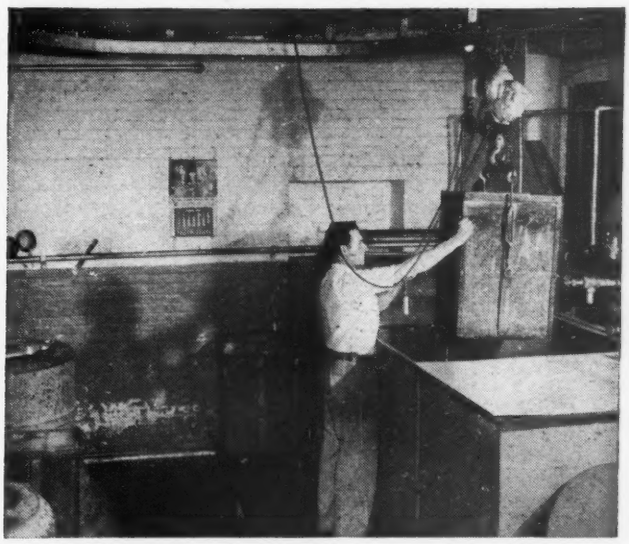
Other than pastes, the company also supplies whole, broken, and chipped nuts, both raw and roasted; nut butters and flours; also crunches (made of various nuts plus macaroon paste). National processes over 150 varieties of nuts into many times that number of finished products.

In accompanying pictorial panels, reference letters of photo captions key with indicated points on flow diagram.

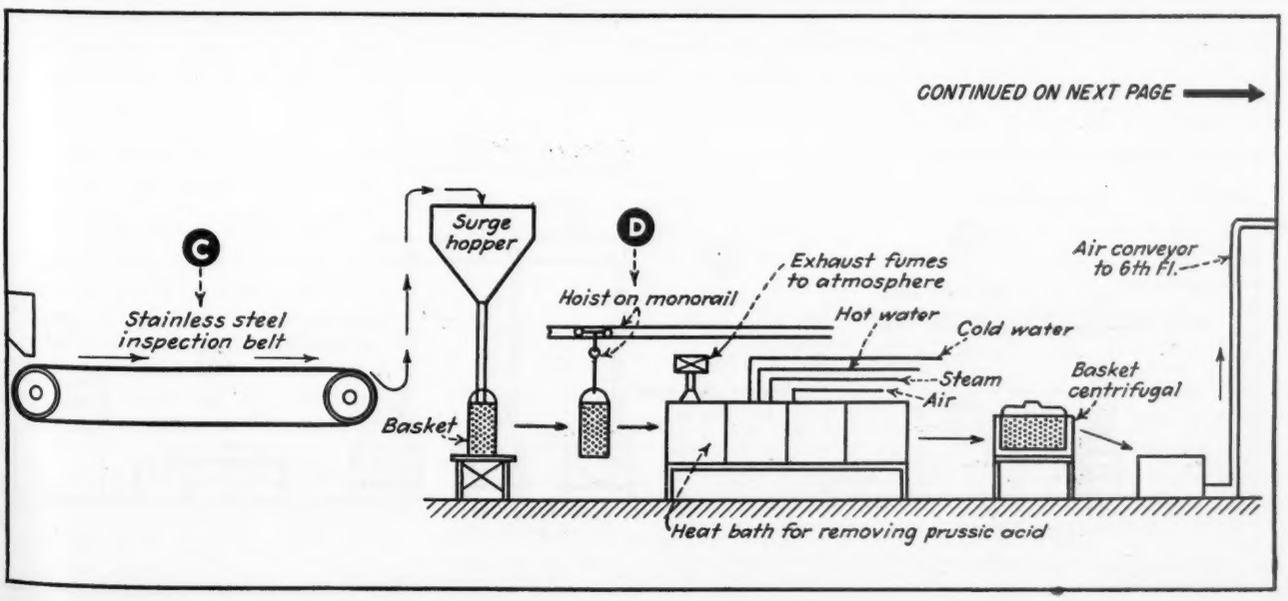


RUDOLPH BECKER, National Almond Products Co. founder and president, has been active in the field for 33 years.

C. INSPECTION of blanched nuts is made on stainless-sheet-steel conveyors by operators stationed alongside belt.



D. PERFORATED baskets containing nuts receive a hot water bath for removal of prussic acid. Cold water wash follows.

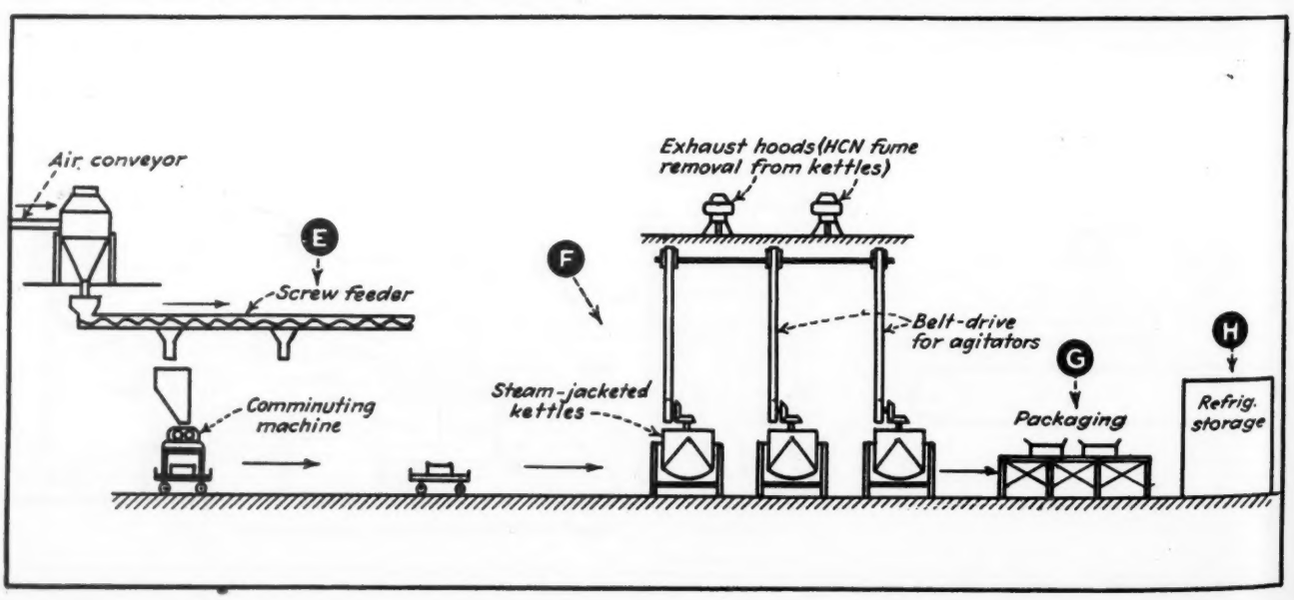


E. BATTERY of comminuting machines grinds nuts, dropping bits into aluminum trays for delivery to mixing kettles.

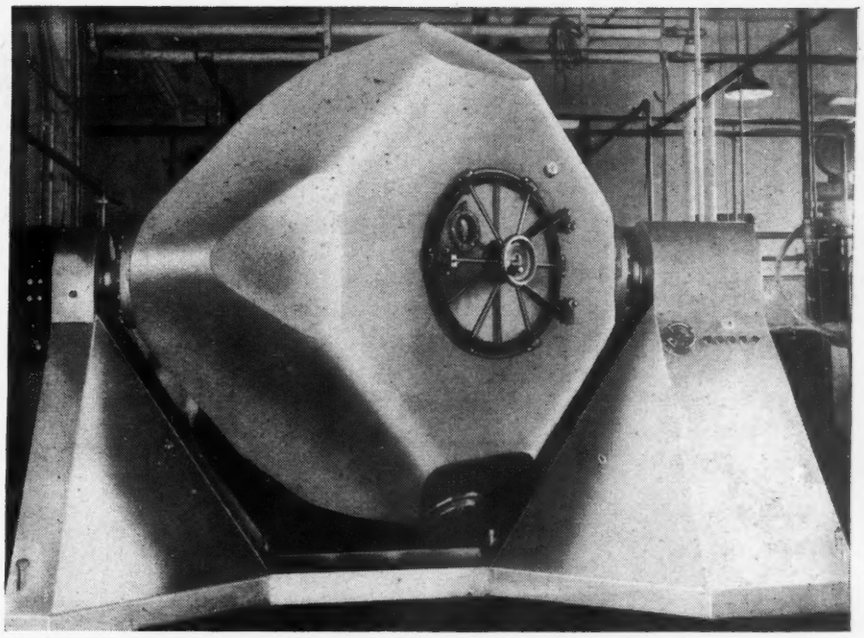
F. STEAM-JACKETED copper kettle mixers are used to reduce the nut bits to a paste of 11 percent moisture content.

G. PASTE is removed from the kettles and packaged. Cold water taps to kettle jackets have quickened the cooling.

H. STORAGE of finished product is in air-conditioned room. Temperature is held at 40 deg. F., with R.H. 60 percent.



Comprehensive data on properties of aluminum and its alloys which might conceivably affect their utility in the handling and processing of foods are presented in handbook of Department of Scientific & Industrial Research, London



EXAMPLE of cast aluminum unit is this churn made by Jensen Machinery Co., Bloomfield, N. J. It has been in use 16 years at Golden State Creamery, Arcata, Calif.

Food Industry Use of Aluminum Discussed in British Report

PRACTICAL information of interest to the food processor is collected in a 154-page technical handbook, titled *Aluminum and Aluminum Alloys in the Food Industry*, recently published by Britain's Department of Scientific & Industrial Research.* This work, Food Investigation Special Report No. 50, is a survey of existing knowledge on the subject. Author is J. M. Bryan of the Low Temperature Research Station, Cambridge. The report was approved by the Food Investigation Board.

Importance of aluminum in the British food industry has increased steadily over many years, and it is now used extensively for plant, equipment, containers and wrapping materials.

Difficulties Overcome

Many of the earlier troubles arising from the corrosion and pitting of aluminum were largely overcome before the war, but the advantages and the limitations in its uses in connection with food were not fully appreciated. With a view to extending the usefulness of the metal, the Low Temperature Research Station, Department of Scientific & Industrial Research, gathered all available information relating to those properties of aluminum and its alloys which might conceivably affect their corrodibility.

This information, which was scattered and uncoordinated, is given for the first time in this comprehensive and critical report.

Properties Discussed

Aluminum possesses many desirable qualities which make it suitable as a material for use in contact with foods and beverages. It is employed extensively in dairies; in breweries; in canning, bottling and preserving; in the processing of breakfast cereals, soups and other prepared foods; in refrigeration plants in the preparation of fats, edible oils, acetic acid and vinegar; in distilled water systems; and in the storing and conveying of industrial waters.

The numerous difficulties initially associated with aluminum were due to use of metal of inferior quality and too light a gage. Recognition of these sources of trouble has led to a great improvement in the reliability of aluminum equipment.

The black stain which sometimes develops on aluminum utensils has been the subject of controversy and investigation. This dark film is quite harmless, and it can be removed by boiling, in the affected utensil, some water containing a little vinegar.

The fact that aluminum does not discolor gelatine makes it a suitable material for the preparation of this product. Also, because of its high heat conductivity this metal has been used with success for baking pans employed in bakeries. Since aluminum has little adverse effect on fermentation catalysts, it is also suitable for the construction of equipment and appliances for industrial fermentation reactions.

Resistance to Corrosion

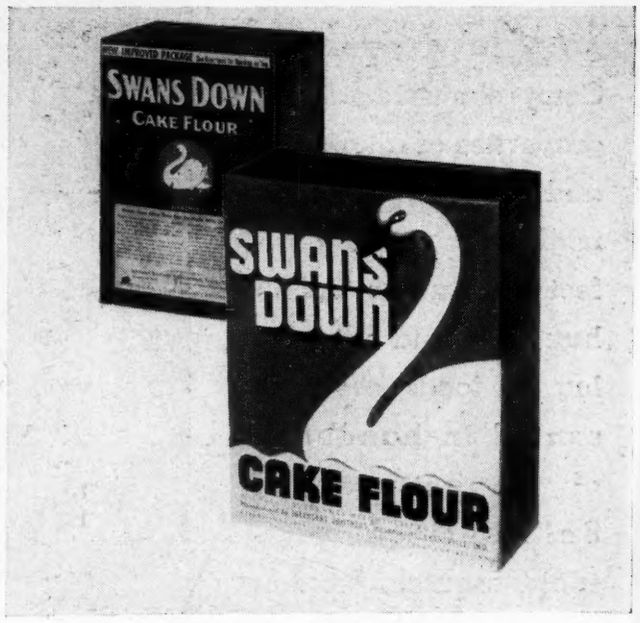
It is clearly shown by the survey that aluminum is inherently a very reactive metal and that its resistance to corrosion is entirely due to the presence of a highly protective film of oxide on the surface.

The protective properties of this film have been considered both in relation to particular conditions at the surface of the metal and to type and condition of the solution with which it is in con-

(*Continued on page 217*)

* Park House, 24 Rutland Gate, London, S.W. 7, England. Report is available from His Majesty's Stationery Office, York House, Kingsway, London, W.C. 2, price 3 shillings net, or by mail 3 shillings, 4 pence.

Simple—Instead of "Busy"



Larger Swan is Eye-Stopper

Is Your Package

Attention to design details will bring rewards—improved facility

By JIM NASH, Package Designer
New York City

SOUND PLANNING of package design facilitates handling of packaged foods in both production and distribution, and it creates greater "impulse" sales. Through pre-knowledge of what happens in production, the designer can turn out packages which will reduce waste and spoilage, and save time.

Properly designed packages will simplify handling all along the line. In food stores such packages will aid clerks in rapid and accurate identification of stock—and help customers in their selections.

In designing a new package, information must be obtained on the limitations and tolerances in plant production. Such data may deal with forming, filling, closing, sealing and overwrapping. Obviously, the use of good grades of basic materials is fundamental.

This information, for example, applies to printing on those areas of cellophane wrappers that are heat-sealed. After the cellophane is wrapped around a carton, the sealing irons will become fouled with ink accumulations. This condition can be corrected by omitting ink in these areas.

In another instance, wax paper wraps for bread cannot always be applied absolutely "true" because of variations in the size of the loaves. Design of the wrap provides for liberal leeway, so that each loaf may be wrapped precisely.

In the store, it is not unusual to have several varieties or numerous flavors of one food in stock. Imagine the difficulty in keeping stocks of beans in order. The varieties are almost endless. There are: (1) Baked beans—vegetarian, Boston style, with molasses, and with pork and tomato sauce; (2) green beans—cut, whole, stringless, shoestring, julienne, and Kentucky Wonder; and (3) wax beans—yellow, cut, whole, and julienne. The problem of variety is further complicated by the different brands and container sizes.

Design Affects Distribution

Initial speed and simplification is achieved by designing the shipping case itself so that the bulk stock can be quickly and unmistakably identified.

In rearranging shelf stock in food stores, especially on Mondays, the problem repeats itself. Take soup as an example: Most soups are identified by too-small lettering in the name of the variety. Time wasted in focusing the eye on such lines adds up considerably, not to mention delays due to errors.

This problem is also found with other packaged items, such as baby foods, desserts, preserves and spices.

The Chris Hansen Laboratories, manufacturers of Junket, have a unique method for fast identification of the various flavors. On each package there is a large, colored initial—a brown "C" for chocolate, a yellow "L" for lemon, or a red "R" for raspberry.

Welch's grape juice is now identified by a bunch of grapes on the label. And this company's marmalade is identified by an orange, while its tomato juice is identified with a tomato.

To speed stocking procedure in self service stores, some packages are now designed with a white area on the top for marking prices. In this way, the price can conveniently be stamped on each package. Also speeded is the check-out when the customer wheels up her basket. This is one example of ingenuity. There are many others—for instance, design to enable further use of the container in the kitchen after the product has been used.

Packages can be designed to create more sales through greater impulse buying. This is done by designing the packages so as to stop the consumer's eye as it travels rapidly across the checkerboard pattern of packages on the shelves. Emphasis is made to attract the attention of the consumer so that she will tend to pick the package off the shelf and "be sold."

Big Raspberry "R" Tells Flavor

Handy Spot for Stamping Price

Properly Designed?

of production, greater convenience in store handling, and better sales

The Swans Down cake flour package was redesigned for General Foods Corp. with the object of dominating the face of the package with the shape of the trade-mark swan. The diagonal curve on the package stops the eye. Not only is the product one of the top selling cake flours, but it also has one of the least expensive labels.

Effect of Design

Values of eye attraction and recognition are evident. In a split second, the eye should distinguish one package from another on the shelf. Yet, it is surprising how alike many of the packages are. Most packages have a name on the top, a horizontal or angled area of color, an illustration of a dish of the product, and the signature. Conventionally, all are arranged in the same order and general proportions.

A large food chain in the southeast, the Colonial Stores, is close to the problems of self-service selling. This distributor has recognized the need for, and responsibility of, special package design by using a new trade-mark—the Colonial Store's rooster. Incorporating the initials "C" and "S" in the rooster's body, this simple device has created fast, effective recognition of the chain's products. Previously, this company had a confusing number of Colonial-brand names.

A single symbol is easier to recognize than a series of them—especially when the one symbol is distinctive. A brand name is actually a series of alphabetic symbols.

Two-faced packages—the same front and back—are giving way to single-faced packages. The opposite face is now being used for further "selling"—that is, recipes, "how to use" copy, premium offers, and the like. The "how to use" copy is valuable in increasing the consumption of the product by indicating a variety of ways to prepare the food for best results.

TRY THIS 10-POINT TEST

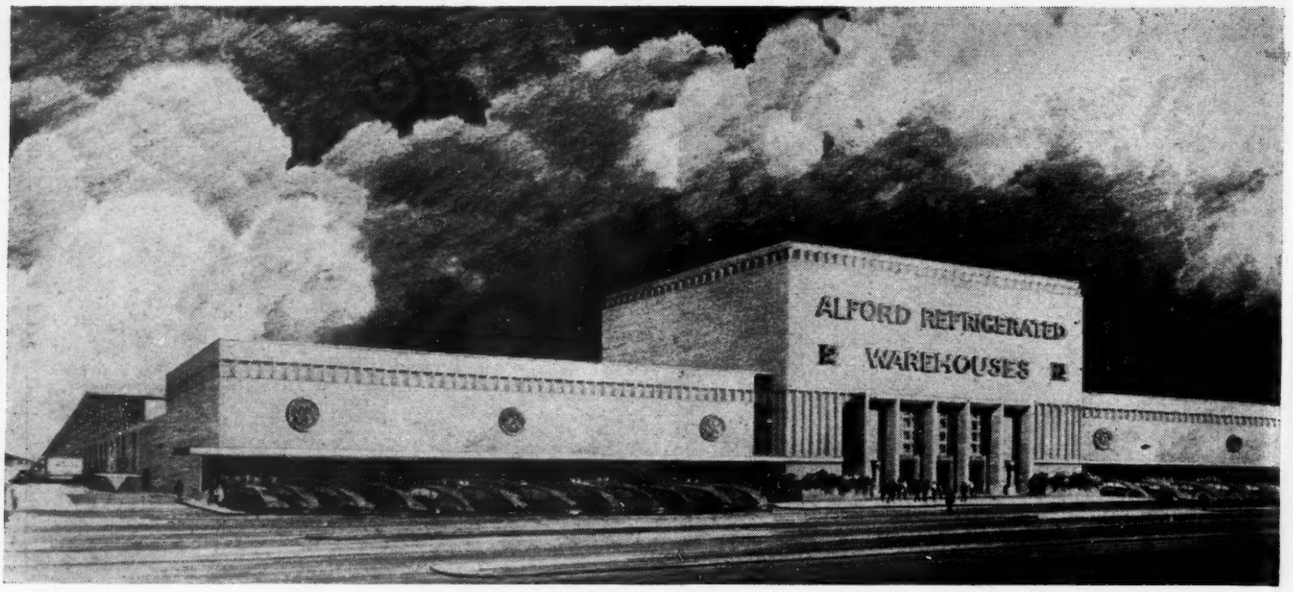
To weigh the effectiveness of your package, take a pencil and check its design for the prime factors listed below. On points where you believe the package design does a top job, mark the square in the "full score" column; where you consider it only "fair and open to improvement," mark the "half score" square.

	Full Score	Half Score
1. Package is patterned for time-saving, "smooth running," in the production processes	☐	☐
2. Good materials are employed – paperboard, wrappers, transparencies, inks; well printed	☐	☐
3. Quickly identified by store clerks, simplifying handling and shelving, also the check-out	☐	☐
4. Speedily recognized – distinguished from others – by customer	☐	☐
5. Simplicity for customer eye-appeal, combining interest to create urge to buy	☐	☐
6. Skillful selection and use of colors	☐	☐
7. Optimum "selling" of trade name	☐	☐
8. Optimum use of "selling" space, while retaining contrast and appeal	☐	☐
9. Simply opened; practical means of dispensing product; good closure for retaining product prior to further use	☐	☐
10. Specific applications of ingenuity or novelty, where feasible	☐	☐

Rating: If you wish, you may give your package a relative rating (based on 100) by scoring 10 for each "Full" and 5 for each "Half." Should your item be a conventional can, credit it with an arbitrary 10 points on Factor 9, to maintain a balanced score.

Main purpose of this test is to put the finger on the weak points in your package design – the factors, particularly, where the design is unsatisfactory (no score), and also where it is open to improvement (half score). These are aspects demanding your immediate, and careful, attention.

It is suggested that you rate your package twice – both before and after reading the accompanying article. Your re-check, following consideration of Mr. Nash's pertinent points, likely will show that you over-rated your package the first time. – *The Editors.*



Huge Refrigerated Warehouses

Advanced engineering and mass production methods used in building

BY OSCAR LEIDING, Former Associate Editor, "Food Freezing"

A KING-SIZE project for the warehousing of food is rising in Dallas, Tex. Taking shape only a mile from the downtown business district, on one-time floodland of the now-tamed Trinity River, are three buildings comprising the world's largest refrigerated warehouse, a dry storage warehouse of equal size, and a completely air-conditioned office building with a large auditorium for use of the food industry.

Sheer size of this $5,250,000 enterprise is only one claim to distinction, however. Other important features include: (1) Complete mechanization of warehouse operations; (2) the provision of "cooled" space in the dry storage building, where a temperature under 70 deg. will be maintained the year around; (3) elimination of congestion in receiving and delivering merchandise by reason of a private boulevard between the warehouses and 15-ft. covered truck and railroad docks along the full length of each building; (4) adequate work space and breakdown rooms for frozen food distributors, and (5) a research department which will conduct continuous research on improved methods of preserving food by refrigeration.

This mammoth plant is the creation of Fred F. Alford, whose first connection with the refrigerated warehouse industry came a bare twelve years ago. As an accountant, he was called in to advise the creditors of the ailing Merchants Cold Storage Co.

Knowing nothing about the business, he analyzed the records of past performances and took as his basis of income the worst year in the company's history.

"I satisfied myself that I could operate the business at a profit, on the basis of the lowest income in the history of the company," he said recently. "I increased individual wages, built up a better organization and reduced overall costs."

Not only did he put the firm on a sound financial basis, but he found he liked the business enough to want to stay with it. So he acquired the plant, changed the name to the Alford Refrigerated Warehouses, and proceeded to make such a success of the operation that, today, the facilities of a dozen-years ago have been quadrupled.

New Design

The new plant owes its design to the experiences gained and ideas generated in that operation. It is Alford's creation in the fullest sense of the word; for not only did he design it himself, but he is acting as his own contractor—and trying out a lot of special ideas in construction.

Construction started last fall. By October 1 of this year there will be in operation not less than 2,000,000 cu. ft. of refrigerated space and a substantial amount of general merchandise storage space. The entire project will be completed by the end of the year since, under the terms of a $3,500,000 loan granted to Alford by the RFC and the First National Bank, the funds must be expended within 12 months.

What's the need for such a mammoth project?

"Until these warehouses are in operation," Alford explained, "Dallas and the Southwest will still be carrying on with substantially the same refrigerated warehouse space as they had in 1926.

"This important geographical division has a population of 17,000,000. Its spendable income is in excess of $12,000,000,000 annually. Dallas is on the southern transcontinental all-weather railroad route.

"Since 1926, the Dallas trading area has perhaps doubled in population. Moreover, the Rio Grande Valley has gone into the frozen foods business in the last few years, and Dallas is the logical transit storage point. Even without this development there has been a shortage of storage space.

"Dallas is a natural funnel for traffic through the Southwest, and the food production being developed in the Rio Grande Valley is going to make this section competitive with food shipped from the West coast."

Bring Model Storage at Dallas

7,500,000-cu.-ft. refrigerated and 350,000-sq.-ft. controlled-temperature dry storage

The new warehouses are two parallel, one-story, steel and concrete structures, each 1,700-ft. long. They are 250-ft. wide, counting the 15-ft. truck dock running the entire length of one side of each building and the 15-ft. railroad dock running the entire length of the other side.

There will be no columns on the docks, so there will be no interference with mechanized food handling equipment. Protection from the elements will be afforded by cantilever awnings extending 5 ft. over the street on the inboard side of each building, where the truck docks are; also over the railroad cars on the outboard side of each building; where double tracks will accommodate 80 cars alongside each warehouse.

The refrigerated warehouse will contain 7,500,000 cu. ft. of refrigerated space for both freezer and cooler storage and for the freezing of food. Its nearest rival in size is the 5,500,000 cu. ft. Merchants Refrigerating Co. building in New York City.

The 1,700-ft. length of the warehouse is divided into seven sections 200 ft. wide and, since they run from dock to dock, 220 ft. deep. Between sections are 50-ft. work spaces (see plan accompanying this article).

A typical section will be composed of three rooms. The two outside rooms will be coolers, 55 x 200 ft. There will be a freezer between the coolers in each section, 110 x 200 ft. All refrigerated space will be insulated so that sub-zero temperatures can be maintained and the coolers converted to freezers if necessary. Temperatures for frozen food storage will be from −5 to −10 deg. F.

Ceiling heights will be 25 ft. with 20 ft. in the clear for palletization.

"We were the first ones to start palletizing operations in a freezer", said Alford. "This new plant will be particularly adapted to palletized handling of carload or large quantity shipments in and out, both for all types of cooler products and frozen foods. Cold storage rooms will have automatically operated doors to speed traffic.

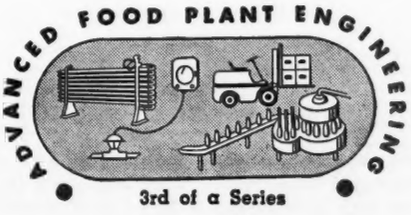
"Distributors of frozen foods have been handicapped in their operations through their inability to obtain break-down rooms for their handling work. We will provide adequate work space and break-down rooms.

Ceiling-type blowers will be used for refrigeration, which means that every foot of floor space will be available for storage. These blowers comprise coils through which the refrigerant circulates. Fans are mounted behind the coils to circulate the cold air. Ammonia will be used as a refrigerant for the freezers and brine for the coolers. The cooling units are relatively light in weight. They will be suspended from the ceiling so there will be no interference with warehouse operations.

In the typical warehouse, the refrigerant circulates through pipe coils, usually of 2-in. pipe, covering the ceiling of the rooms. As frost builds up on these coils, it decreases the efficiency and must therefore be removed. With merchandise stacked under the coils, this presents a major problem.

In Alford's new warehouse the cooling units will be equipped with spray nozzles over the coils. For defrosting, a portable water tank with an electric pump will be brought into a room. It will be connected to inlet and outlet quick-coupling connections of the unit and water will then be sprayed over the coils. The melted frost and spray water will flow to the tank of the portable unit. The coils are enclosed in a housing that prevents leakage.

To facilitate the icing of refrigerator cars, Alford will operate his own car-icing plant in the refrigerated warehouse.



Dry Storage Warehouse

Across a 100-ft. private street from the refrigerated warehouse—this street being for the trucks loading and unloading at the two buildings—is the dry storage warehouse. This building will

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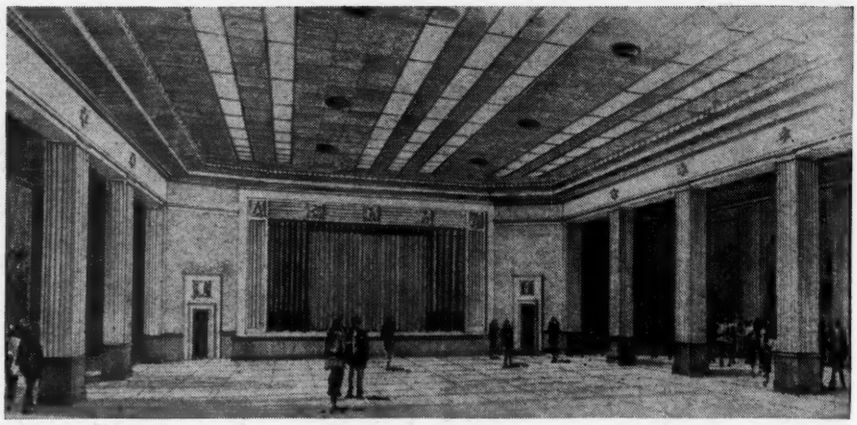
FRED F. ALFORD, company president. The new warehouses are his creation.



AUDITORIUM for convenience of the food industry, is to be located in the office building. It will seat more than 400 and be equipped with a stage, kitchen and dressing rooms.

have a storage area of 350,000 sq. ft. for non-perishable or semi-perishable foods, such as canned goods and condiments.

"So far as I know," says Alford, "no other warehouse in the country will provide the service which will be available in this building—the maintenance of a temperature of 65 to 70 deg. F. the year around."

Large amounts of surfaces have been provided in the cooling units, so that close temperature difference between refrigerant and room temperature may be held, thus obtaining high humidities. This will result in low shrinkage rates of stored products subject to shrinkage. On the other hand, where a dry condition is necessary, it may be obtained. Each room will contain multiple units, and humidity conditions will be controlled by varying the number of units in use and the refrigerant temperature.

At first, this building was intended as a conventional dry storage structure. However, the plans were revised to make provision for air conditioning of any part of the building down to 65 deg. F. Where an air-conditioned atmosphere isn't necessary, the equipment won't be used—but the whole building will be equipped with the necessary facilities.

Modern Office Building

Third structure in the development is a modern office building of steel and concrete. It has a four-story center section and is two stories high on either side. This building will contain about 50,000 sq. ft. of air-conditioned office space.

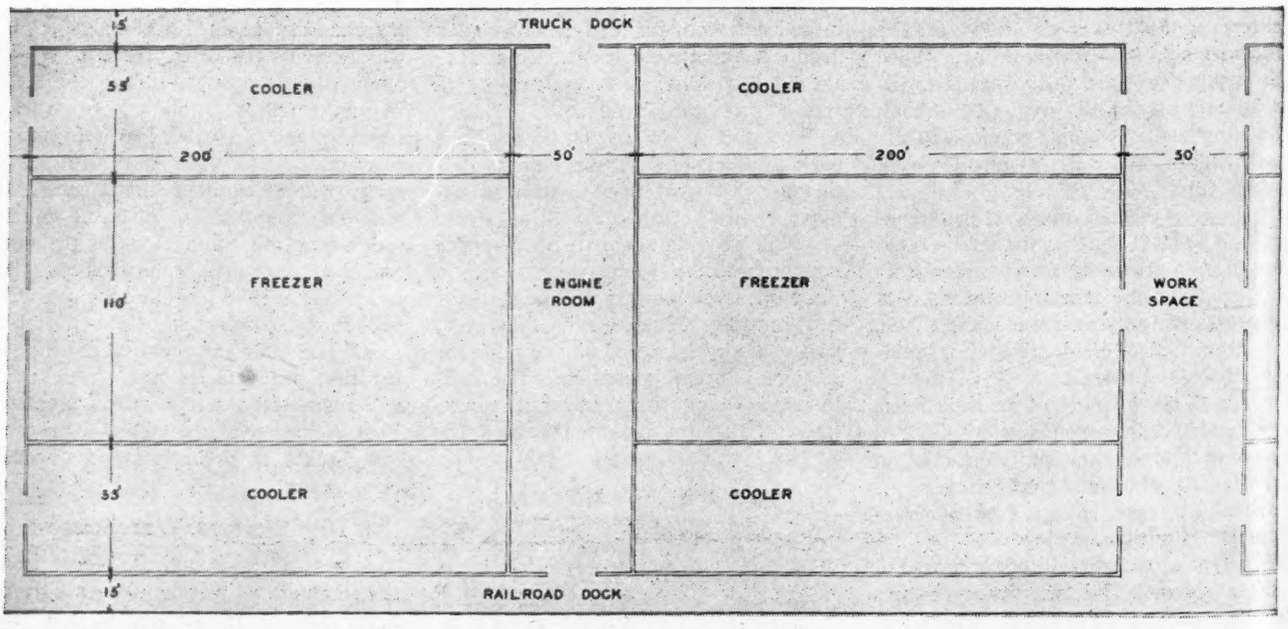
A feature will be an auditorium with a seating capacity of more than 400. It will be equipped with a stage, kitchen and dressing room, for the convenience of the food industry. It is to be available at no charge for food demonstrations, cooking schools, regional sales meetings, industry get-togethers and conventions. It will have motion picture facilities.

The ground floor of the office section will be available for distributors' show rooms or retailers' sales rooms. The offices of the Alford Refrigerated Warehouses will be on the second floor. There will be office space on both floors for rental to company customers.

Included in the operation will be a research department. Continuous studies, seeking improved methods of preserving food by refrigeration, will be conducted here.

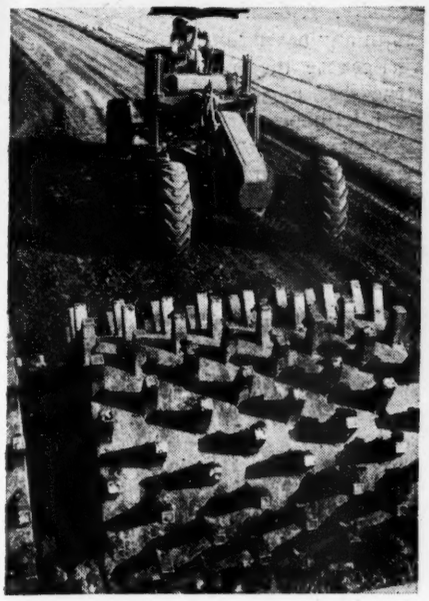
"Our research facilities will be available to the industry free," Alford said. "It is our plan to provide the space, refrigeration and necessary labor, but at this time we do not plan to set up within our own organization a corps of food technologists. This may be a later development."

Refrigerated Warehouse Layout

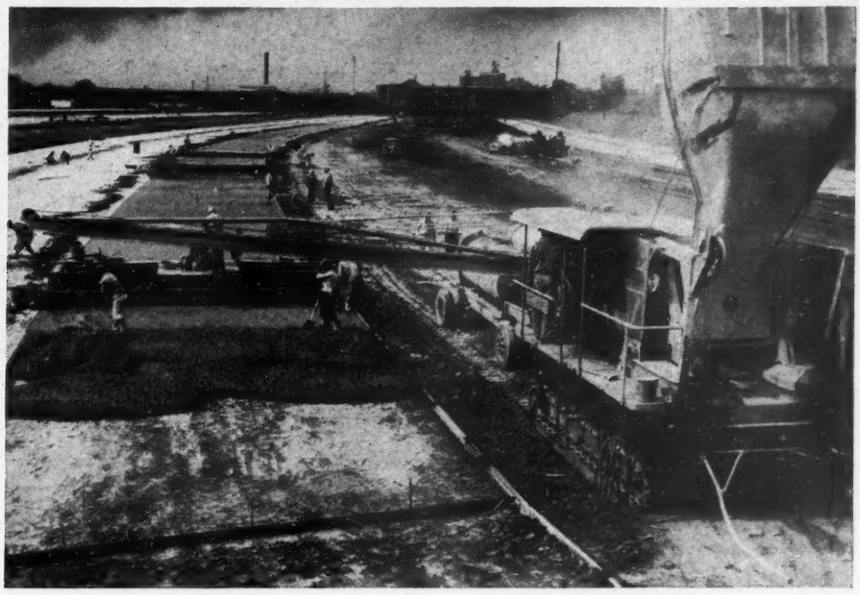


SEVEN SECTIONS, each made up of one freezer and two coolers in a 200 x 220-ft. space, will comprise the refrigerated warehouse. Plan above shows two such sections. A truck dock is to extend the full length on one side, while railroad facilities (two sidings, each with space for 40 cars) will go along the other. Engine room, shown, will contain gas-engine driven refrigeration compressors.

Modern Construction Methods Are Being Employed Throughout



Fill Is Compacted, Graded



Mobile Mixer-Distributor Lays Floors

Then Steel Rises Over Engine Room and First Freezer Storage

Maj. Gen. Richard Donovan, a West Pointer who retired from active duty in the U. S. Army last year, has been appointed vice-president and director of research.

The company will generate its own power, utilizing the abundant natural gas of the area. Ingersoll-Rand gas engines and Electric Machinery Mfg. Co. generators, will be used.

As stated earlier, a direct expansion, full-flooded ammonia system will be used in the freezers and circulating brine in the coolers. The refrigerating system for freezing will be identical with that in the frozen food storage rooms, except that additional units will be provided, permitting a temperature of from —30 to —40 deg. F. Blast tunnels will be used for freezing those commodities benefited by extremely quick freezing.

To provide the 1,000 tons of refrigeration required in the refrigerated warehouse, there will be 285 "Recold" water defrost ceiling type coils.

The refrigeration system will originate in the engine and machine room in the center of the building. Here, Ingersoll-Rand XVG angle-type gas engine driven compressors will do the job of providing both high and low temperature storage.

Materials Handling

Efficiency of operations is the main objective of the design. "The plant will be 100 percent mechanized," Alford explained. "There's going to be lots of room for fast operation. That's something we want to do—expedite operation—for we want to hold down the cost of warehousing food and give better service.

"We'll use fork-lift trucks, tractors, trailers, pallets, and such other powered equipment as may from time to time become available.

"To make the best use of that equipment, there'll be plenty of room to operate. For example, the truck and railroad docks are wide enough for two-way traffic.

"The 100-ft. private boulevard between the warehouses will give plenty of room for all truck operations. The railroad docks are cut in the same generous pattern. With double sidings laid along the full length of both buildings, we will be able to operate in and

Company Palletizes Its Frozen Foods

BEEF CARCASSES, in present storage, are frozen on special pallets having 4-ft. long 2 x 4's set in sockets in each corner. Galvanized pipes, inserted in holes in the 2 x 4's, support boards that form shelves for the beef. Posts, pipes, and boards may be removed to make pallets suitable for general use.

FROZEN EGGS on pallets are mechanically stacked at present plant of company.

out of 40 cars at each building at one time and have 40 additional cars at each building."

The tract on which the project is rising lies alongside the main line of the Rock Island Railroad. It also is near the exchange yard used by all railroads entering Dallas. The Rock Island is building the storage tracks to serve the property, but a reciprocal switching agreement will permit the interchange of cars with other railroads without penalty to warehouse customers. The site also permits access to all main highways without passing through the business section of Dallas.

In this construction project, Alford is applying the same let's-look-for-a-better-way approach that characterized his entrance into the refrigerated warehouse business—and for the same reason, to cut costs.

"Due to volume, mass economy and efficient construction methods," Alford says proudly, "We're getting this development done for a reasonable cost."

The floors of the warehouses and the boulevard between are an example of the simplification of a construction problem. They became nothing more than a highway project 10-mi. long by 18-ft. wide.

Using heavy equipment, the dirt was first compacted to four times its normal density. A 6-in. floor was laid on this, as in any paving operation.

Because the building floors are at truck-bed and freight-car-floor height and the floor rests on a dirt fill, it was necessary to have a concrete retaining wall around both buildings.

"The orthodox method of constructing a retaining wall is to dig a ditch to the appropriate depth, set up wooden forms on each side, and fill in the space with concrete," Alford points out. "Then remove the forms and fill the dirt on the inside of this wall.

"But the perimeter of our two buildings is over 7,000 ft. This meant that we had to have a concrete wall about 8-ft. high and 1½-mi. long. The construction of forms would have been a major item.

"Instead of using forms, we rolled and packed the dirt fill about 5 ft. beyond the edge of the retaining wall, handling the dirt with heavy earth-moving machinery. Then we set up a machine which automatically dug a trench 18-in. wide and 8-ft. deep around the building line. Reinforcing steel was dropped into place in this trench and it was then filled with concrete. After the concrete had set, the dirt around the outside of the wall was scraped away with big bulldozers, leaving the concrete dock wall exposed.

"By using this method, we installed the retaining wall in ten working days —a job that would have required months had we followed the orthodox practices. We saved a lot of money."

Redwood Insulation Used

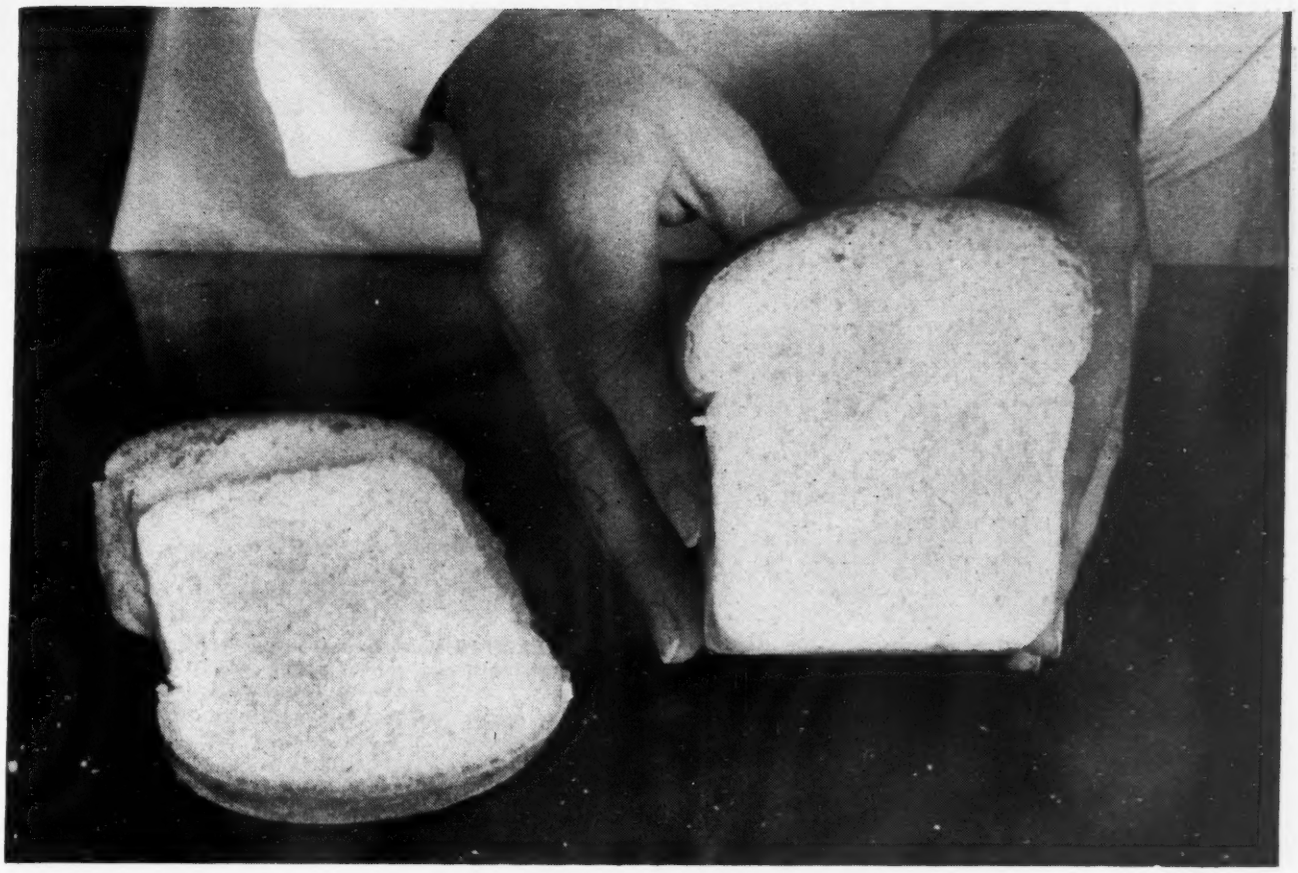
There is no floor insulation, but the walls and ceilings will have 12 in. of redwood bark.

"Cork is the usual insulation," Alford said, "but I can't see why I shouldn't use something just as good—if not better—from right here in our own country, instead of getting materials from abroad.

"Redwood bark in 12-in. thicknesses is equal to 12 in. of cork in low thermal conductivity, according to published laboratory tests. And this bark is vermin-proof and fire resistant." In all, 3,500,000 lb. of shredded redwood bark will be used.

Alford put his own skilled warehousemen on the job of erecting 3,500 tons of steel. "These fellows are experts at moving goods," he explained, "and what's the difference whether it's food or steel?"

If his project, big as it is, turns out to be too small for the growing needs of the area, there'll be plenty of room for expansion. The buildings now being constructed will occupy about 17 acres —but there are 60 acres in the site.



▶ **Correct Ingredient Proportions**

▶ **Omission of Dough Rising Step Before Freezing**

▶ **And Thawing of Dough in Wrapper Before Baking Result In—**

Improved Bread Made From Frozen Dough

By CLARA M. McPHERSON and MINA W. LAMB

Dept. of Foods & Nutrition, Div. of Home Economics

Texas Technological College, Lubbock, Texas

LABORATORY investigations now indicate that three steps are effective in controlling the quality of bread baked from frozen doughs: (1) Use of correct ingredient proportions in the formula, (2) elimination of the dough rising step before freezing, and (3) thawing the dough in its original wrapper before shaping the dough and then baking it.

These investigations—conducted in the Dept. of Foods & Nutrition at Texas Technological College, Lubbock, Tex.—show that the amount of fat, sugar, yeast and whole wheat flour influences the flavor and texture of the bread. Furthermore, frozen doughs can be held longer in storage, if the doughs are not raised before being frozen. But, the longer the doughs are held in storage, the longer they take to rise. The surface drying of the dough and subsequent development of streaks in baked loaves are prevented by allowing the doughs to thaw in the wrapper.

First step was to learn the proper method of thawing doughs. Next, the best formulas for white and whole wheat breads were determined by varying the proportion of ingredients and the method of preparing the dough before freezing. This information was finally used to determine the quality of white and whole wheat breads baked from frozen doughs which had been held for as long as 20 weeks in freezer storage.

The effects of ingredient variations in the dough formula, number of risings allowed for each batch of dough before freezing, and the length of storage on bread quality are shown in the summary of batches (see special summary table accompanying this article, page 97).

Experimental Technic

To aid in understanding the conclusions reached, a consideration of the experimental technics employed is of

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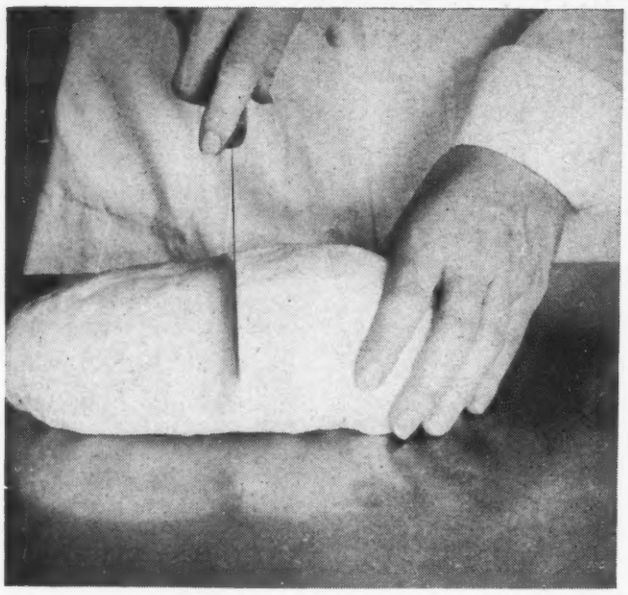
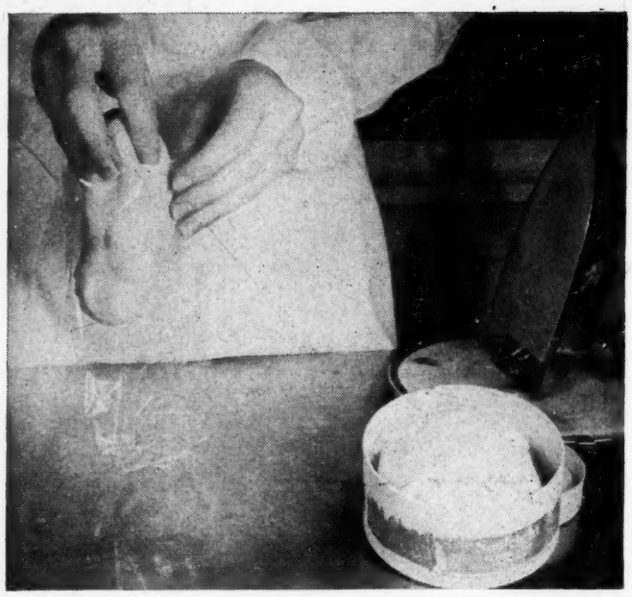
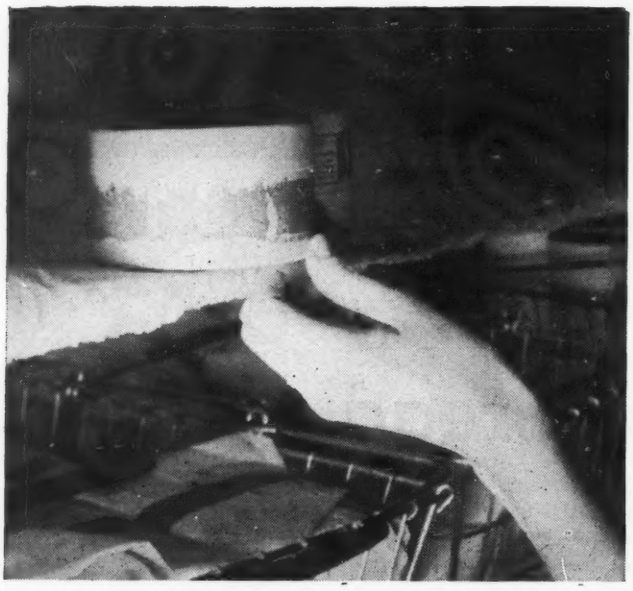
These Are the Four Steps That Precede Baking



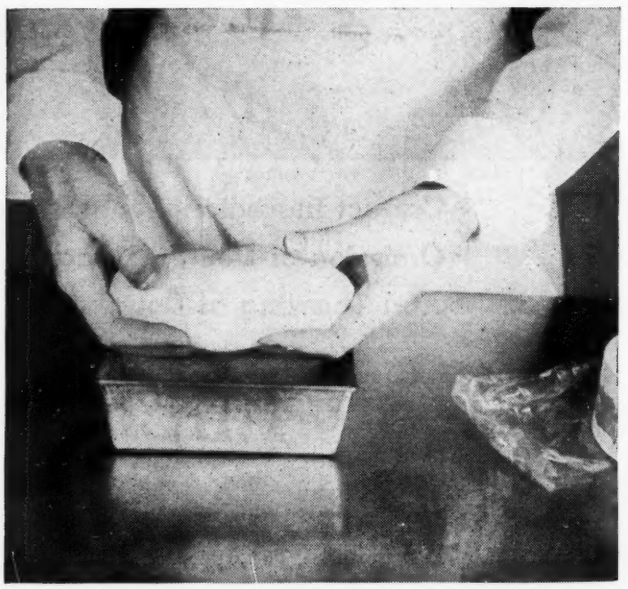
1. DIVIDING the dough into ½-lb. units after it has been kneaded for 5 min., rounded, and greased on the surface.



2. WRAPPING and heat sealing the dough in cellophane and packing it in cartons—when dough is to be frozen.



3. FREEZING packaged dough at —10 deg. F. and then storing at 0 deg. F. Frozen doughs were stored as long as 20 wks.



4. SHAPING the dough after it had been allowed to thaw in the wrapper. Then it is baked for 30 min. in an oven.

particular interest. The basic formula used in these tests was:

Whole fresh milk	244.0 g.
Granulated sugar	12.5 g.
Hydrogenated oil	12.5 g.
Salt	6.0 g.
Compressed yeast	14.0 g.
All purpose flour	364.0 g.
or	
Whole wheat flour	364.0 g.

Detailed below is the procedure in preparing the batches of dough:

Dissolve yeast in one-half the amount of milk. Add the remaining milk lukewarm. Then add sugar, fat and salt. Into this mixture add flour gradually and mix to a smooth dough. Place dough on board and knead for about 5 min., until dough loses its stickiness. Round dough and lightly grease the surface. Place dough in a bowl to rise until double its size. Punch dough and divide into ½ lb. units. Place dough in loaf pans and bake. If dough is to be frozen, wrap in moistureproof cellophane, heat seal and pack in waxed cartons. Quick freeze at —10 deg. F. in commercial plant and then store at 0 deg. F.

Thawing the Dough

In the initial procedure, frozen doughs (Batches 1 and 2) were removed from the cellophane wrappers and allowed to thaw at room temperature; but this method proved unsatisfactory, since the surface of the dough became dry, resulting in streaks within the baked loaf. The problem was corrected by allowing the dough to thaw in the cellophane wrapper. This was also done to keep the dough soft and moist.

After the dough was permitted to defrost for 1½ to 2 hr., it was sufficiently pliable to be unwrapped, shaped and then allowed to rise in loaf pans. The surface of the dough was greased to prevent drying, and the loaf pans were then placed in lukewarm water to warm the dough more effectively.

When the dough was pressed lightly with a finger and a slight impression remained on the surface, the dough was considered ready for baking. The dough was baked for 30 min. in a gas-fired oven, kept at 400 deg. F. Finally the bread was cooled, examined, and then scored.

SUMMARY OF BATCHES OF DOUGH

Their Storage Periods and Quality of Baked Breads

Batch number	Batch description	Storage, weeks	Average score*	Quality of bread
1	Standard recipe, 1 rising before freezing	0	32.0	Slightly coarse texture. Increasing compactness with storage. Yeast exhaustion apparent.
		4	27.5	
		6	24.5	
2	Standard recipe, 2 risings before freezing	0	32.0	Increasing compactness with storage. No loss of flavor.
		2	25.0	
		4	28.0	
3	Standard recipe, ½ yeast, 1 rising before freezing	0	32.0	Increasing compactness with storage, indicating yeast exhaustion. Flat taste in baked product at 12 weeks.
		2	27.0	
		4	25.0	
		6	23.5	
		12	21.5	
4	Standard recipe, ½ yeast, 100 percent increase in sugar, 1 rising before freezing	2	21.0	Product improved with storage. No loss in appearance, texture, or flavor.
		4	29.5	
		6	29.0	
5	Standard recipe, ½ yeast, no risings before freezing	2	29.0	Product improved with storage. No loss in appearance, texture, or flavor.
		4	28.0	
		6	29.0	
		12	30.5	
6	Standard recipe, ½ yeast, 75 percent whole wheat flour, 25 percent white flour, 1 rising before freezing	3	24.0	Increased compactness and loss of flavor with storage.
		5	28.0	
		7	26.5	
		14	25.0	
7	Standard recipe, ½ yeast, 50 percent whole wheat flour, 50 percent white flour, 1 rising before freezing	3	20.0	Product improved with storage up to 14 weeks. No loss of flavor.
		5	29.0	
		7	31.0	
		14	27.5	
8	Standard recipe, ½ yeast, 100 percent whole wheat flour, 1 rising before freezing	3	21.5	Rapid loss in appearance, texture and flavor with storage.
		5	22.5	
		7	18.5	
		14	12.5	
9	Standard recipe, ½ yeast, 100 percent increase in fat, 75 percent whole wheat flour, 25 percent white flour, 1 rising before freezing	2	31.5	Rapid loss in appearance, texture and flavor with storage.
		4	22.0	
		6	23.5	
		13	12.0	
10	Standard recipe, ½ yeast, 100 percent increase in sugar, 75 percent whole wheat flour, 25 percent white flour, 1 rising before freezing	2	20.0	Texture improved with storage, but flavor deteriorated.
		4	29.5	
		6	26.0	
		13	25.0	
11	Standard recipe, ½ yeast, 50 percent increase in sugar, no rising before freezing	0	33.0	Gradual loss in appearance, texture and flavor through 20 weeks of storage.
		4	32.0	
		8	28.0	
		12	25.5	
		20	23.5	
12	Standard recipe, ½ yeast, 50 percent increase in sugar, 50 percent whole wheat flour, 50 percent white flour, no risings before freezing	0	33.0	Very slow loss in appearance, texture and flavor through 20 weeks of storage.
		4	31.5	
		8	30.5	
		12	29.5	
		20	28.0	

*Maximum score = 33

When the standard amount of yeast was used in the formula and the dough was raised before freezing (Batches 1 and 2), the quality of the bread was poor. This condition was attributed to lack of nutrient material for supporting yeast growth after the dough was raised upon its removal from the storage room.

Reducing the yeast content 50 percent (Batch 3), resulted in more active yeast growth and better quality breads.

Quality of the breads was improved by adding more sugar to the standard formula. Breads made with a 50 percent increase in sugar (Batches 11 and 12) were better than those containing a 100 percent increase in sugar content (Batches 4 and 10).

Increasing the sugar content 100 percent was advantageous for breads prepared from doughs held more than two weeks in storage. This was true with white and 75-percent whole wheat breads. Breads made from dough held two weeks in storage scored lower than the same doughs stored four and six weeks.

Breads prepared from two-week old dough were compact and gummy in texture. On the other hand, breads made with older doughs were lighter. It is believed that the longer holding periods result in lighter breads because hydrolysis proceeds further—starch to sugar and sugar to alcohol and CO_2. The additional sugar, however, resulted in a sweeter bread. It was the belief of some of the judges that the additional sweetness imparted to the bread was undesirable.

Bread made from dough frozen for two weeks with 75-percent whole wheat flour and 100-percent fat increase (Batch 9), scored high. But, bread prepared from the same doughs held 4, 6 and 13 weeks were compact and small in volume.

Two factors are responsible for restricting CO_2 expansion within the cell structure and thereby preventing the formation of light bread: (1) Additional fat lubricates the gluten strands, making them less tenacious, and (2) whole wheat flour contains protein that has a poorer baking quality than the protein in white flour.

Dough Risings

Doughs raised before they were frozen could not be stored for any length of time without showing yeast exhaustion. The quality of the bread was poor, being adversely affected by the number of times the dough was raised before it was frozen. It was found that as the number of risings increased, the quality of the bread became worse. This is due to a loss in the amount of food material for yeast growth after the dough is thawed and then raised. When no food is available for the yeast, the dough will "sour" and it will not rise, as shown by Batches 3, 8 and 9.

If the dough was not raised before it was frozen, it could be frozen and stored without showing yeast exhaustion (Batches 5, 11 and 12). Batch 12 scored high, even after 20 weeks of storage. This indicates that the step of raising the dough before freezing should be eliminated, especially for breads containing 50-percent whole wheat flour.

In general, the quality of the bread was poor when dough was stored six weeks' or longer. Exceptions, however, were Batches 5, 7 and 12. Some doughs were of poor quality when the dough was stored 3 to 4 weeks (Batches 1, 2, 3, 8 and 9). Dough containing 50 percent whole wheat flour (Batches 7 and 12) could be stored longer than dough with all white

(*Continued on page 213*)

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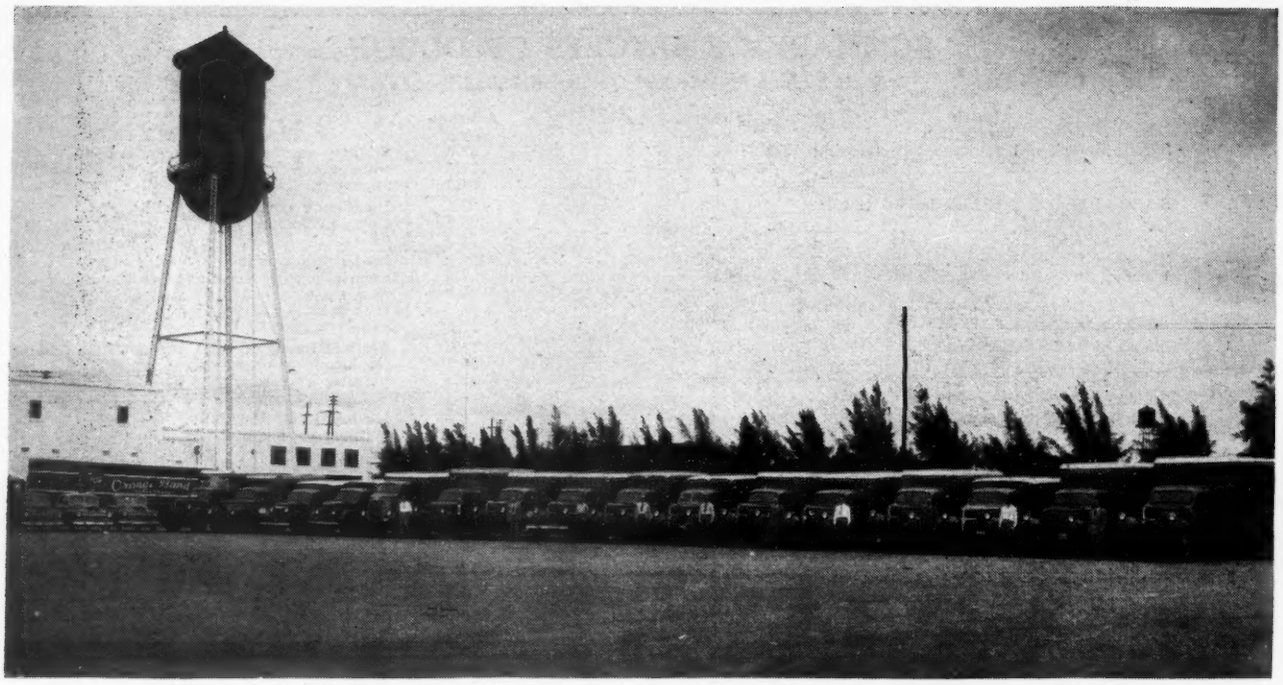


Company owned units carry livestock to plant and . . .

Warehouses Are By-Passed In This Trucking Operation

Deliveries are made direct to dealer outlets in cities as far as Miami and Jacksonville and, in other cases, direct to smaller sausage peddling trucks

ITS business built through the use of company owned automotive equipment, without recourse to railroads, common carrier truck lines or hired trucks, the Fred Herman Co., Tampa, Fla., picks up livestock on cattle trailers and distributes finished products throughout the entire State of Florida, on its own refrigerated trailers and trucks. The company employs six tractor-trailers and 20 smaller trucks.

The tractor fleet consists of four units with open-sided cattle trailers and two units with panel refrigerated trailers. The smaller trucks are 1½- and 2-ton models with refrigerated bodies.

In sale coverage of the state, the Herman refrigerated tractor-trailers make regular trips with the company's Orange Band line of skinless wieners and other packing house products. They travel from Tampa on the west coast to the two principal east coast cities of Miami and Jacksonville. Miami is 200 miles from Tampa and Jacksonville 275 miles.

On these runs a total payload of 30,000 lb. is carried. The tractor-trailer empty weighs 30,000 lb. so there is a gross laden vehicle weight of 60,000. This is the maximum allowable gross weight for a tandem-axle trailer with a maximum individual axle loading of not over 18,000 lb.

Two Models

The tractors are all Macks. Five are Models EHT and the largest and the latest, placed in service on March 13, 1946, is a Model LFT, with a 510 cu. in. displacement engine and 11.00-20 tires all around. This tractor pulls a Nabors 34-ft. semi-trailer, with an inside width of 7 ft. 6 in. and an inside height of 6 ft. 8 in. This gives a cubical capacity of approximately 1,700 cu.ft. The smaller trucks are practically all Dodges.

In its sales distribution, the Herman company maintains no cold storage warehouse space in cities other than at its plant in Tampa. Deliveries are made to dealer outlets in the cities outside of Tampa. Generally the merchandise is unloaded from the distribution trailers directly onto smaller refrigerated sausage peddling trucks.

The cattle trailers haul nothing but inbound livestock consisting of steers and hogs. Likewise the two-panel trailers haul nothing but finished products. No return loads are carried in either type of service.

All the Herman vehicles operate entirely within the State of Florida. Because of the high outside temperatures encountered in the state both winter and summer and the perishableness of the food products handled, all of the panel truck and trailer bodies are both insulated and refrigerated.

The 34-ft. Nabors trailer is insulated with Fiberglas. A 4-in. thickness is used on the sides and ends and 6 in. on the roof, with 6 in. of cork in the floor. The interior body temperature maintained ranges from 36 to 38 deg. F.

On the smaller trucks the same temperature range is achieved through the use of conventional methyl chloride or

. . . Distribute processed meats through State of Florida

Freon, gasoline engine-driven refrigerating systems. On the large Nabors trailer, however, the refrigerating compressor is driven from the forward tandem axle of the trailer when the unit is in motion, and by an electric plug-in motor when the vehicle is at rest. This arrangement eliminates the separate small gasoline engine usually employed. The trailer axle compressor drive was invented and patented by a former maintenance superintendent of the Herman company and has been used successfully for a number of years.

With this compressor, the usual dead or trailing front axle of the trailer tandem is replaced by a live axle, such as is used on the rear of a conventional truck with the axle driven by a propeller shaft from the truck engine. Instead of the drive or power moving from front to rear as on the conventional truck, however, the trailer live axle drives from rear to front. The front end of the propeller shaft carries a pulley which drives the refrigerating compressor by means of a belt. The compressor is mounted ahead of the axle below the trailer floor.

Of course, the above arrangement operates the refrigerating unit only when the tractor-trailer is in motion. When the trailer is being loaded or is parked, some means must be provided to keep the refrigerating unit in operation. This has been achieved by a direct compressor motor drive, which can be plugged into a 110 volt electric light circuit.

An orange color is the standard Herman company vehicle paint. The tractor cab, trailer body and all wheels are orange, with the wheel rims blue. The trailer trim, lettering and the tractor splashers are black as is also the tractor engine hood to better reflect the sun's rays from the driver's eyes.

REFRIGERATING COMPRESSOR is in cabinet below trailer floor. Driving propeller shaft extends from live front tandem axle.

Will Processed Foods Like These . . .

Nutritional Improvement

Improvements in processing, additions of special nutrients, will be stimulated

By HALDANE GEE
Managing Editor
"Food Industries"

REGARDLESS of future cost or production problems, progressive food processors will pay a great deal of attention to the "nutritional improvement" of their products in the years immediately ahead.

"Nutritional improvement" is a convenient blanket term for the preserving of the vitamin content naturally present in fresh foods and for the addition to foods of nutrients, including vitamins, minerals and protein.

Vitamin retention, restoration and enrichment are phases of nutritional improvement. The use of natural vitamin sources in fortification or enrichment may add to a product certain mineral salt or protein values at the same time.

There was much interest in the vitamin enrichment of foods prior to World War II. But during the seller's market of the war and post-war years, it was not so necessary to consider the nutritional superiority of a particular food product. As the grocery shelves become filled, however, normal competition returns, and a demand for higher nutritional values may be expected—and no doubt, a new wave of promotion.

It should be said at once that the channels are not being cleared for the wholesale addition of vitamins to all kinds of foods, nor should they be. Indeed, the course is being set more in the direction of processing improvement than towards a list of things to mix into the food. And any exploitation of the improved foods will undoubtedly be tied to the consumer's real nutritional needs, to the extent they are known. There can be no going overboard with extravagant appeals. The changes in products will be small, but significant. There will, however, be opportunities to capitalize on them, in a conservative way.

Two general factors are shaping the trend. The customer's nutritional consciousness has been aroused. The regulatory agencies are resuming work on standards and requirements, sidetracked to a large extent during the war, but now forcing decisions on questions of nutrient additions.

The consumers are becoming alert on label and promotion claims—both alert and suspicious. They are tired of over-enthusiastic advertising, especially claims for the benefits of vitamins. For much of this disappointment, some of the less conservative pharmaceutical manufacturers are probably responsible. One usually gets no magic results from vitamin pills of the daily maintenance variety, and their cost is considerable. Benefit to the individual is seldom apparent, and any improvement in community health is difficult to prove.

"Nutritional Improvement"

Do you know about nutritionally improved foods? Is your branch of the industry ready for the new emphasis expected on the vitamin content of foods? What about other nutrients, including mineral salts and amino acids? These questions will be covered in a series of special articles in Food Industries. This article, the introductory one, mentions some of the problems ahead. Other articles, to appear from time to time, will deal with various phases of nutritional improvement of interest to the processor.

Public Receptive

The public, in consequence, is ready to receive its protective amounts of vitamins—and other important nutrients—through food, as nature originally supplied them, instead of as medicine. This is especially true if

NUTRIENTS AVAILABLE FOR CIVILIAN CONSUMPTION PER CAPITA PER DAY*

Nutrients	Units	1935–9 Average	1943	1944	1945	1946	1947 Preliminary	1948 Indications	1948 as a percentage of 1935–9	1948 as a percentage of 1947
Food energy	Cal.	3,250	3,400	3,470	3,370	3,380	3,420	3,340	103	98
Protein	Grams	89	99	100	103	100	98	95	107	97
Fat	Grams	132	142	145	138	145	143	139	105	97
Carbohydrate	Grams	428	430	440	428	418	433	428	100	99
Calcium	Grams	.90	1.02	1.04	1.08	1.12	1.07	1.04	116	97
Iron	Mg.	13.8	16.7	18.5	19.0	18.6	18.3	17.8	129	97
Vitamin A	I. U.	8,100	9,200	9,400	9,800	9,300	8,700	8,500	105	98
Thiamine	Mg.	1.54	2.19	2.28	2.24	2.26	2.15	2.11	137	98
Riboflavin	Mg.	1.86	2.20	2.48	2.55	2.56	2.45	2.38	128	97
Niacin	Mg.	15.4	19.1	21.6	21.9	21.5	20.7	20.1	131	97
Ascorbic acid	Mg.	115	126	132	139	135	128	129	112	101

* Data computed by the Bureau of Human Nutrition and Home Economics on the basis of estimates of apparent civilian consumption (retail basis) including estimates of consumption from urban gardens, supplied by the Bureau of Agricultural Economics. No deductions have been made in the nutrient estimates for the loss of waste in the home or for the destruction or loss of nutrients during the preparation of food. Deductions have been made for inedible refuse. The data for iron, thiamine, riboflavin and niacin include the amounts of these nutrients added to white bread and flour under the enrichment program. The 1947 and 1948 estimates assume that voluntary enrichment will continue at the rate required under WFO-1.

. . . Offset This Downturn in Nutrients?

Challenges Processors

by new competition, further regulatory action, consumer's nutritional awareness

there is a saving at the same time. The consumer in this frame of mind is ripe for education in the matter of labels and label claims—he might easily be induced to study them and to be guided by them in making purchases.

The food industries, accordingly, have an excellent opportunity in the furnishing of vitamins in their products in amounts related to bodily maintenance. Accompanying this opportunity is a challenge to supply the essential nutrients in proper amounts and in a form that will not impair taste characteristics.

The processor of vitamin-containing foods has an advantage over the manufacturer of drugs, in that grocery vitamins are usually cheaper than pill vitamins. Synthetically produced vitamins, at present prices, can be incorporated in foods at so little cost as to be hardly significant in retail prices of food. The natural sources of nutrients, however, cost rather more and present greater problems in food technology, but they also give potentially greater nutritional benefits.

The nutritionally improved food will not be sold at a premium. It should, however, be preferred, at the same price. In setting his future course on the vitamin problem, the food processor may be influenced by self-advancement or self-protection. With markets becoming more competitive, the brand which can make the soundest nutritional claims should have the edge over the one that does not, other things being equal. This is the leader's opportunity. And if one manufacturer starts, others will probably follow. But if the industry does little until action is mandatory by government standards, the degree of acceptability of such standards is likely to be directly related to the extent of interest shown by the industry at the standards hearings.

Two Problems

The addition (or preservation) of the vitamins will usually involve two problems, one of which is legal, and the other, technological. The legal requirements must of course be met, but they will differ depending on whether or not there is a standard of identity for the product. The technological problems will vary with the approach —whether the result is obtained by improved processing, by addition of synthetic materials, or by the use of natural sources of the nutrients.

On the score of legal requirements, it may be a difficult and expensive matter to get a new and improved product before the public if changes in standards are needed. The official procedures are not simple and it is discouraging for a small manufacturer to attempt to accomplish anything on his own in a standards hearing. Even if he works through his association, present procedure is still expensive and time-consuming.

There are some critics of the Food and Drug Administration who contend that legalistic procedures have slowed down activities in this field almost to the point of no development. Others maintain that the effect of law and regulations has been to withhold improved foods from the public in some instances. Defenders of F & DA, however, maintain that the public has in no instance suffered, or in any event has suffered less from lack of standards than it would have done had some of the crude earlier proposals been adopted. They also point out that simplification of the legalistic procedures is under study.

Complex Situation

Involved legal requirements, difficulties in modifying them, problems in enforcement are nearly inevitable in the case of a field as complex as that of nutritional requirements. Nutritionists themselves are still working with the problem of establishing the daily requirements of various vitamins, with

conclusions changed from time to time as new experimental evidence appears.

Complexity of the official requirements is shown by a glance at the text of one set of standards. It takes over 600 lines of fine print to cover "Definitions and standards of identity for wheat flour and related products." The requirements have a direct or indirect bearing on the labelling of such products. There are requirements to be considered, too, in the labelling of products for which a standard of identity has not been established.

Label statements are important for the simple reason that the processor who controls or modifies the vitamin content of his product will generally want to say so on the label. In fact, he will generally be required to do so. There are several possible situations. A food may be so processed as to conserve most of its natural vitamin content, in which case a label declaration is not required. But this would leave unappreciated an effort which admittedly lies in the best direction—the route of process improvement. Following the other path, a packed product may be fortified (some may, others not, under regulations) with amounts of vitamins intended to compensate for loss in canning or storage. Here there must be label declaration. These two methods—retention and addition—are both excellent, but they are not equivalent for label purposes.

Dual Standards

If a standard of identity has been established for a food, the product must, of course, conform. In certain cases there are two standards—one with and one without fortification. Examples of dual standards are those for farina and enriched farina. Similarly, there are definitions and standards of identity for alimentary pastes, and complementary ones for enriched alimentary pastes. The amounts and nature of the fortifying ingredients are sharply defined. In general, the F & DA requires such addition to be a substantial part of the daily desirable quantity of the vitamin for a label claim.

As for the use of vitamins in therapeutic amounts, for the treatment of advanced deficiency disease, the food industry should undoubtedly be content to leave the field to the pharmaceutical industry. Products of an intermediate type (containing more than ordinary amounts) may be possible exceptions. Some of these products may be in the established field of baby foods, others in the relatively new field of specialty products for the aged. But there is a whole set of additional regulations for dietary foods.

Sooner or later the industry and the regulatory authorities will have to deal with the question of the total daily intake of any one vitamin which may result if several different kinds of foods are being enriched. It is generally considered that over-dosage is unlikely. There are some nutritionists, however, who consider that excess amounts aside from being wasteful, are definitely undesirable. A higher than restoration level for many foods in the diet is admittedly not in the interest of the public. This situation, obviously, is one for the authorities to control by suitable action.

Dr. Conrad A. Elvehjem . . .

. . . tells Institute of Food Technologists that better distribution of high quality natural foods must be continued; nutritional values can be increased by proper types of processing; certain combinations of foods may be more appetizing and more highly nutritious.

Controlling the Amounts

There are two approaches to the problem of insuring, in the total diet, a sufficiency of the various vitamins without getting into the difficulty of doubling up. One way is to put the emphasis on certain foods or classes of foods, such as cereals. The other way, particularly applicable in the case of thiamine, is to try to make sure that each portion of food carries an amount of the vitamin physiologically equivalent to it.

During World War II, emphasis was placed on a class of products in consequence of the War Food Order requiring bread and flour enrichment. And following the withdrawal of the order, there was accelerated activity on the part of the various states for compulsory enrichment, with the result that some 21 states now have such laws. In consequence, as much as 85 percent of the bread now sold and made at home is vitamin enriched. Quite frequently, enriched bread is sold in areas not subject to regulation, since the manufacture of two kinds is seldom economical.

Enrichment of bread at present levels can, according to one set of calculations, bring the thiamine intake up to the desirable level of 0.5 mg. per 1,000 calories of food energy. But part of this quantity, perhaps 0.32 mg., originates with other foods. Also, some of the unenriched bread may easily be going into the lower income level market. The bread approach is thus only a partial answer, even in the case of thiamine.

Another question in the case of bread is the qualitative completeness of the enrichment. As now carried out, the enrichment restores only a few nutrients, whereas many nutritionists believe that other substances, also of importance, are not restored. Thus present enrichment appears a good first step which could well be followed up by efforts to completely restore other nutrients now milled out.

The problem of enrichment of bread has brought up the question of intra-industry competition, some of which has tended to be restrictive or to delay desirable nutritional improvements. An example of conflict of interest has been opposition to bread enrichment as discouraging the use of skim milk in bread. Another has been opposition to enriched margarine. Such conflicts must be regarded as unsound and uneconomic.

Healthy Competition

In contrast, a healthy type of competition results from the independent improvement of competing foods. An example here is the effort to retain natural vitamin levels in canned goods, improving their position relative to fresh or frozen produce.

Whether to strive for retention of natural vitamin content or to adopt re-endowment or enrichment (by making additions) is one of the processor's technological problems. The retention approach usually involves questions in handling, processing or packaging. While every processor should attempt to retain natural vitamin content, there are limits to what he can achieve economically.

Re-endowment raises the question of what to add. The use of synthetic materials is frequently more convenient and the amount more easily controlled. In this case, known pure vitamins are added. If natural vitamin sources are used, however, the benefit of a complex may be conferred, with unknown vitamins going along with the known. This happens when yeast products are used. Here the questions

of unwanted taste and flavor may have to be considered, along with the possible effect of enzymes.

Not to be ignored among ways of vitaminizing is the physical one of irradiation. This is a direct method which the consumer uses to some extent when he exposes himself to the sun or to the rays of an ultra-violet lamp. But as far as food processing is concerned, the use of irradiation for producing vitamin D concentrate is a better bet than the exposure of the food itself to the active rays.

Regardless of the source or form of the vitamin, adequate control methods are important. The processor wants to know whether his manufacturing methods are uniformly successful. And he may need to follow any diminution of vitamin potency in storage, as may happen with ascorbic acid. Control methods should be simple, but are still complex and expensive in some cases. Thus the assay of every lot or batch is not always feasible. The sampling method then becomes as important as the assay method. In the case of a continuous process, it may be necessary to combine samples. Sometimes the tests can be made more efficiently by a consultant testing laboratory.

Product Problems

The technics of fortification and control are probably more highly developed in the baking, cereal and dairy fields than in other branches of the industry. There is, however, a high degree of awareness in the processed fruit and vegetable division.

Special product situations are exemplified by oleomargarine and sugar. The former is an excellent carrier for the fat soluble vitamins A and D, as was recognized by the War Food Order requiring enrichment. The latter is being considered as a vehicle for thiamine, which can be retained in sugar for at least the period of normal shelf-life, with procedures recently developed. This is an appealing method, especially in view of the relationship between thiamine and carbohydrate. But among points under consideration is the fact that sugar is often used with other foods which already contain thiamine. The sugar route is thus apparently a simple one, but in practice it is most complex. Those investigating it may be ready with some conclusions soon. Meanwhile, sugar, confectionery and related products are unlikely to be used as vehicles for the special nutrients.

Other types of problems are presented by canned meat products and beverages. Under today's price situation, canned meats are in a favorable market position, so that a possible vitamin bonus is at least no factor in selling. In the beverage field, experiments are likely to merge with extensive work on fruit juices, where there are many factors to be resolved.

Many Opportunities

In any event, the food industry in all of its branches present opportunities for nutritional improvement, to the advantage of the public and the processor alike. In the developments ahead, the nutritionist, the food technologist and the process engineer will all be important. As to the direction progress should take, however, there is not complete agreement of biochemical thought.

Program Questioned

Perhaps the most extreme position against what he describes as "doctoring" of foods was taken recently by Dr. E. V. McCollum, Johns Hopkins University, internationally known authority on nutrition, in a lecture sponsored by the Maryland section of the American Chemical Society. The present bread enrichment program is merely needless expense, in Dr. McCollum's opinion, although he recognizes that it is supported by many persons of outstanding accomplishment and unquestioned integrity.

"If there were any convincing reasons for believing that bread 'enrichment' has a considerable health value to the people of the nation, it might be worth what it costs—or would cost with effective enforcement", said Dr. McCollum. "Such evidence appears to be lacking." He notes that vitamin recommended daily allowances (RDA) of the Food and Nutrition Board have been reduced in some cases. He further supports his case against the use of vitamins with conclusions reached in extensive wartime studies of industrial workers, large numbers of whom were given multivitamin tablets for several months and their health status and productivity as workers recorded. "There was but small evidence that anyone was benefitted by vitamin supplements", he says.

Stressing that Americans are better off nutritionally than was supposed a few years ago, Dr. McCollum states: "Many years ago I pointed out that such deficiencies as occur in diets eaten by most Americans are the results of inclusion of high percentages of the total calories in the form of sugar and of highly refined flour and other refined cereal products in the diet.

Stresses Natural Foods

"I believe that every person conversant with modern nutritional research will agree that diets of this type will be much more effectively supplemented by the inclusion of natural foods (vegetables, fruits, meats, milk) than by additions of three vitamins and iron. Hence the 'enrichment' procedure is inferior to other simple alternatives which are available to us.

"Present-day 'enrichment' is a method for improving diets of the type described, but the term 'enriched' is false and misleading, and creates too great expectation of what is accomplished. It is too good a term for what it does".

In his specific recommendation on the bread problem, however, Dr. McCollum actually comes out in favor of the addition of nutrients, although his list does include natural materials: "A more nutritious and equally palatable bread can be produced by adding about 6 percent of skim milk solids, small amounts of dried brewer's yeast, and the germs of wheat and corn, which are now used for animal feed or, in the case of yeast, largely wasted."

Dr. McCollum's views are, however, by no means universally held. Progress of bread and flour enrichment was the subject of a favorable editorial in the *Journal of the American Medical Association* some months ago. For the program itself, both the AMA Council on Foods and Nutrition and the Food and Drug Administration must be given considerable credit. The sense of the editorial was that the program is sound, that it makes up for some dietary deficiencies, but it is strictly a long-term proposition. This does not mean that the AMA is in favor of all-out vitaminization. It is not, as is fairly well known.

AMA Viewpoint

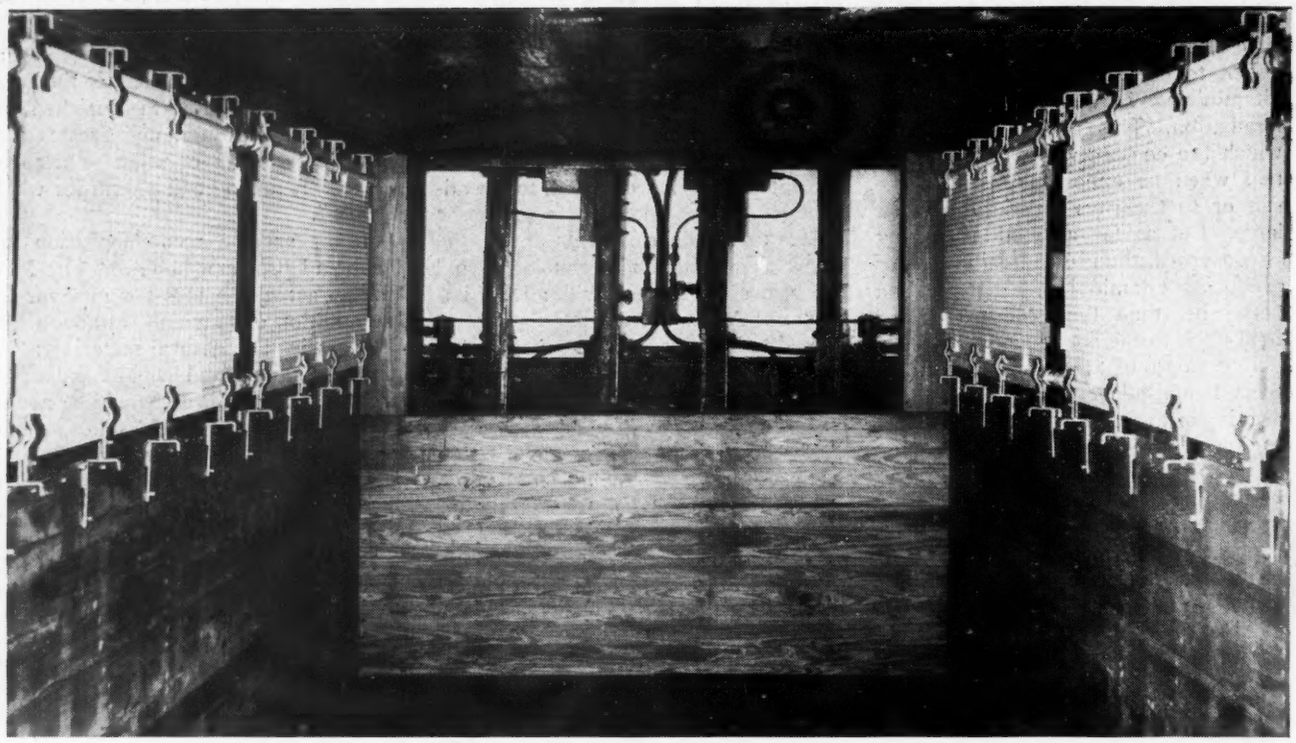
One of those who endorses the general AMA viewpoint is Dr. Conrad A. Elvehjem, professor of biochemistry at the University of Wisconsin, well known vitamin authority. His address at the annual meeting of the Institute of Food Technologists in Philadelphia was reported in part in the July issue of Food Industries.

"The Council (AMA Council on Foods and Nutrition) wishes to encourage efforts to improve as far as possible the nutritive quality of all foods which contribute importantly to the American diet and which thereby constitute the food environment of the people," said Dr. Elvehjem.

"In spite of all these efforts there exist now, and undoubtedly will continue to exist for some time, certain specific deficiencies in large segments of the population which can be remedied best through addition of indicated nutrients to cheap, staple foods that occupy substantial places in the dietary.

"The Council has favored and encouraged the addition of certain nutrients to selected foods for the purpose of overcoming these deficiencies by replacing as nearly as possible that which has been lost in processing or by

(*Continued on page* 218)



INTERIOR view of car (baffle plates removed) shows secondary refrigerant evaporating plates, piping, pumps and dry ice bunker.

Rail Refrigeration Temperatures Controlled With Dry Ice System

Dry ice, supplemented with a secondary refrigerant, evaporating plates and thermostat control, maintains fixed temperatures in rail transit

PREDETERMINED refrigeration temperatures were maintained in transit in a novel reefer car on a test run early this year from Plymouth, Fla., to Boston, Mass.

The car, a Fruit Growers Express refrigerator car, was equipped with a new dual type system manufactured by the Broquinda Corp., St. Petersburg, Fla. It uses dry ice as the primary refrigerant, in conjunction with a special secondary refrigerant used for heat transfer and temperature regulation. In the car were 2500 cases of Minute Maid quick frozen concentrated orange juice, processed at Vacuum Foods Corporation's Plymouth plant.

With this system, the dry ice is contained in bunkers at each end of the car. A capacity load of dry ice enables the insulated car to make an eight to ten day run without replenishing the dry ice, and maintains a temperature of 0 deg. F. inside the car, despite temperatures of 80 to 85 deg. outside.

As the primary refrigerant, the dry ice absorbs heat from the special secondary refrigerant which circulates around the bunker into side-wall evaporating plates. This liquid picks up the heat within the body to be refrigerated and returns to the bunker. The cycle is continuous. The secondary refrigerant is sealed within the unit when in operation and needs no replacement. Because of the nature of this secondary fluid, which will not freeze at −160 deg. F. nor gasify at +160 deg. F., the system operates on a thermo-syphon basis. It is stated that this unit will maintain any temperature from −10 deg. F. up to +60 deg. F.

Small circulating pumps are installed within the circuit, for closer control at any given temperature and to speed pull-down time. These pumps are actuated by electric motors controlled by thermostats set for the determined equipped with a 1500w. generator,

The car employed in this test was equipped with a 1500w. generator, belt-driven from a car axle pulley. Controls for the entire system were mounted under the car and sealed against the weather, with a small door incorporated for access to the control panel. Operation of the system merely required loading a charge of dry ice into the bunkers and setting the controls for the desired temperature.

Loading

The accompanying chart shows that with an outside temperature of 80 deg. F., the car was pre-cooled to a temperature of 0 deg. F. in 16½ hr., claimed to be the fastest pull-down time ever recorded. This temperature was held until loading time—12:30 p.m. on Jan. 29, 1948.

Temperature of the product loaded

BUNKERS were loaded with 5782 lb. of dry ice. At intermediate points, amount used was estimated. Total used in test, 4620 lb.

LOADING the frozen orange juice at Plymouth, Fla. Juice temperature at loading, 11 deg. F.; at Boston receiving end, 5 deg. F.

varied between +10 to +11 deg. F. The car was open for a period of 4½ hr. during the loading operation. Twelve resistance-thermometer bulbs were inserted into the cans of the product for direct temperature reading.

This system, primarily designed to maintain temperatures at a pre-determined pre-cooled temperature, was able to reduce the orange juice temperature to +6 deg. F. in the short time of 3 hr. after loading was completed. On arrival at Boston, the temperature of the frozen juice had been reduced a total of 6 deg. F.

Dry Ice Consumption

In Plymouth, a total of 5782 lb. of dry ice was loaded in both bunkers. At the completion of the test (8:15 a.m. on Feb. 4, 1948) a total of 4640 lb. of dry ice had been used. This is an hourly consumption of 28.6 lb., or a total daily consumption of 686 lb., including pre-cooling of the car from 80 deg. F. to O deg. F. for 24 hr. of operation.

In all, this car was under test for 162 hr., and the average outside temperature was 57.5 deg. F. The temperature of the commodity was reduced from 10–11 deg. F. at time of loading to + 4 deg. F. on its arrival at Boston. No re-icing was necessary after initial pre-cooling at the start of this special test.

Uses Cited

Termed suitable for all types of transport refrigeration, this system is indicated to be economical, especially where long hauls are required and when zero or sub-zero commodity temperatures must be maintained.

CHRONOLOGICAL TEMPERATURE CHART OF REFRIGERATION TEST RUN

Date	Place	Time	Temperature in Deg. F. Outside	In car Low	In car High	Dry Ice in lb. Consumed	Dry Ice in lb. Loaded
1/27/48	Plymouth, Fla.	3:10 p.m.	80	74	76	———	———
"	"	3:55 p.m.	79	73	75	———	5,406
"	"	4:40 p.m.	79	70	75	———	System started
"	"	8:55 p.m.	76	33	36	———	———
1/28/48	"	3:00 a.m.	71	22	25	———	———
"	"	9:30 a.m.	58	0	2	———	———
"	"	4:15 p.m.	58	−1	1	———	———
"	"	6:45 p.m.	58	−3	−1	———	———
1/29/48	"	10:15 a.m.	60	−4	−2	———	———
"	"	11:20 a.m.	64	−4	−2	———	376
"	"	12:20 p.m.	68	−5	−2	———	Started loading
"	"	5:30 p.m.	64	18	21	———	Finished loading
"	"	9:00 p.m.	56	8	10	———	———
1/30/48	Wildwood, Fla.	12:30 a.m.	54	6	8	1,776 est.	———
"	Baldwin, Fla.	12:05 p.m.	54	4	6	———	———
"	Savannah, Ga.	5:50 p.m.	45	4	5	———	———
1/31/48	Richmond, Va.	7:45 p.m.	26	4	5	———	———
2/1/48	Alexandria, Va.	3:15 a.m.	20	4	5	3,776 est.	———
2/3/48	Boston, Mass.	4:15 p.m.	24	4	5	———	———
2/4/48	"	8:15 a.m.	8	4	5	4,646 lb.	———
	Total	162 hr.				4,646 lb.	5,782 lb.
	Average deg. F.		57.5	4	5		

Note — Temperature of pre-cooled commodity on loading, 10 to 11 deg. F. Total time to load commodity 4½ hr. Total dry ice consumption per hr., 28.6 lb. or 686 lb. per 24 hr. Car equipped with 12 resistance thermometer bulbs. Temperature variation in car 2 deg. F.

Having the prime capacity to reduce temperature (pull-down) to 0 deg. F., the system clearly demonstrates that it is possible to load refrigerated cars within 3 hr. for products requiring medium temperatures (35 to 40 deg. F.) and within 5 hr. for low temperatures (−10 deg. F. to 5 deg. F.) after the car has been serviced with dry ice. This saving alone to shippers and carriers cannot be precisely estimated, but it is considerable.

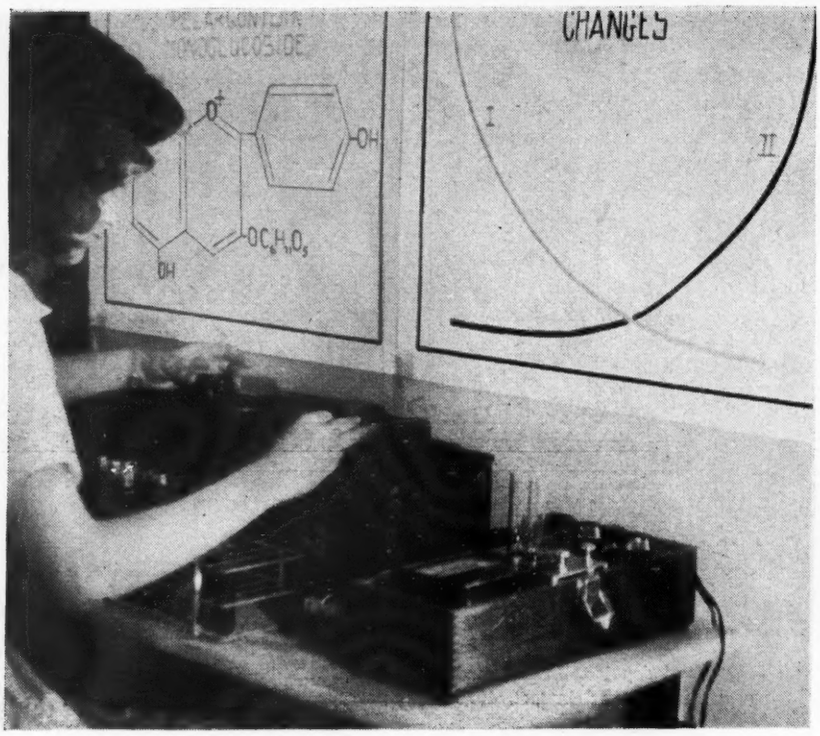
In addition, cars can be equipped to carry frozen goods and perishables from 10 to 20 days without having to re-ice during transit. Refrigerated cars can then run non-stop between the West and East coasts in 5 days, instead of the 10 to 20 days with several re-icing stops enroute, as is now commonly the case.

The company has scheduled extensive tests with its equipment for the remaining summer months. Reports received on tests made to date already indicate that the system is reliable for transport refrigeration. Should the additional tests confirm the fact that dry ice refrigeration can be controlled, then undoubtedly it is a reliable and economical method of transport refrigeration.

Costs

Although it has been stated that the cost of dry ice is prohibitive, the use of dry ice in conjunction with this new equipment assures the user that he will obtain the maximum refrigeration from a pound of dry ice, and that the commodity will arrive at its destination at the correct temperature for the particular product.

Use of this method of refrigeration should go a long way to help eliminate the losses in transit sustained in frozen and perishable products due to unreliable refrigeration.



Tests Point Way . . .

To Reduce Color Loss In Strawberry Preserves*

Spectrophotometer checks indicate high temperature effects may be lessened by greater care in cooking, immediate cooling below 65 deg. F., storing below 60 deg. F., and refrigeration when product is held for long periods

By Z. I. KERTESZ and ERNEST SONDHEIMER,
Division of Food Science & Technology, New York State Agricultural Experiment Station, Cornell University, Geneva, N. Y.

DATA have recently been collated promising some measure of success in curbing rapid losses of color in strawberry preserves during their manufacture and storage—losses which have detracted from the appeal and hence commercial value of the product.

Granted little is known of the mechanism of the change, except that it involves primarily the loss of red color and secondarily the formation of brown and yellow pigments. However, it has been determined that high temperatures play a big role in the color losses—and we do have specific means of combatting such excessive temperatures.

Pederson, Beattie and Stotz[1] have discussed the occurrence of such reactions in fruit juices, and Thompson, Cecil and Woodroof[2] in preserves. The latter trio found that, contrary to general belief, light is not a major factor in causing color changes. Loss in red color, it was found, is more rapid in strawberry juices than in strawberry preserves.

In our own studies on the mechanism of color changes in strawberry preserves[3], we determined the effect of various storage times and temperatures on shelf-life of the product. We will detail the results of these tests and include pertinent observations.

The dominant red anthocyanin pigment of strawberries has been recently isolated[4]. But little is known about the nature of the changes in the anthocyanin constituent of strawberry preserves during storage. On the other hand, there are several theories about the formation in such products of the "secondary" yellow and brown pigments[5]—a subject which has attracted much attention in the past few years. However, there is not sufficient knowledge on how these colors are formed in strawberry preserves to warrant a discussion of the possible chemical reactions involved.

A method for measuring the red color in strawberries and strawberry

* Journal Paper No. 764, New York State Agricultural Experiment Station. These investigations were supported in part by grants from National Preservers Assn.

products is now available[6] Such measurements may be expressed in terms of "Congo red equivalents" (CRE)—units denoting the mg. percent concentrations of this dye at equivalent color intensities. Accordingly, the red anthocyanin content will be designated in such CRE units.

Although no exact and generally applicable quantitative method for the measurement of browning color developments in strawberry preserves is available, we feel that the non-anthocyanin absorption at 500 millimicrons might be taken as indicative of the extent of browning. This non-anthocyanin absorption may be calculated from data obtained during the measurement of the anthocyanin color.

Factors Affecting Red Color

While reflectance measurements might be ideal for expressing the actual color of a preserve, methods have not yet been developed to use them. Since the light absorption of pigments in solutions can be accurately and conveniently measured, it is frequently used to express color. However, in the case of anthocyanins, the absorption of the pigment and, therefore, the color is not only affected by the concentration and types of anthocyanins present, but also by such factors as pH, certain heavy metallic ions, protective colloids, and co-pigments[7].

Where large destruction of anthocyanin has not taken place (in the case of strawberries and strawberry products), the peak of absorption in the visible range of the spectrum is always at a wave length of 500 millimicrons. Crystalline pelargonidin 3-monoglucoside, isolated from strawberries and dissolved in Sorensen's sodium citrate-hydrochloric acid buffer, also has its main absorption peak in the visible light range at 500 millimicrons. This indicates the absence in strawberries of interfering substances capable of producing changes in the position of absorption peaks with respect to wave length.

As yet, factors which affect the intensity of absorption, other than pH changes in the acid range, have not been found. Substances like sucrose, pectin, and citric acid (buffered to constant pH) in concentrations normally found in preserve extracts did not affect the absorption at 500 millimicrons.

It was noted that strawberry preserves had constant pH values of 3.4 ± 0.10. Greater variations, however, were noted by Robinson, Lee, Slate, and Pederson[8] in fresh strawberries. These differences in pH were not enough to account for the large variations observed in the color of fresh berries.

We believe, therefore, that the determination of anthocyanins in optically clear solutions is a good indication of the red color of preserves.

Anthocyanin Determination

By the method previously described for the determination of anthocyanin in strawberries and strawberry products, anthocyanin and non-anthocyanin absorption can both be ascertained.

Briefly outlined, this method consists of substracting the optical density, $\log_{10} Io/I$, of a strawberry preserve extract (diluted with sodium citrate-hydrochloric acid buffer) at a wavelength of 500 millimicrons and at pH 3.4 from one observed at pH 2.0. This value is converted to mg. percent CRE and, after multiplying by the dilution factor, is proportional to the anthocyanin content of the sample.

For the purpose of this article, this

Practical Use of These Findings

HIGH TEMPERATURES have an adverse effect upon the color of strawberry preserves. While the cooking step cannot be eliminated, something should be done to minimize high temperatures associated with this operation. More important, the preserves should be cooled below 65 deg. F. as soon as possible. Chief cause of the poor color of many of the strawberry preserves on the market may be attributed to the common practice of cooling them to only 100 deg. F. before they are packed in cases.

Storing the preserves at high temperatures in warehouses is another factor responsible for adverse color changes. Two measures are suggested for avoiding appreciable color changes: (1) Keep the warehouse temperature below 60 deg. F., and (2) use refrigeration whenever the preserves are stored for any length of time at temperatures exceeding 60 deg. F.

In drawing any conclusion from these tests, there must be consideration of the variations occurring in the color, flavor, and other characteristics of strawberry preserves made by different manufacturers. Some of these differences may be caused by the nature of the raw materials; others by the processing technics employed. Consequently, variations may be expected in the extent to which different lots of strawberry preserves lose their color. Storage-test results reported in this study were obtained with high quality products having excellent color and flavor and good consistency.

Color Analyses—Berries vs. Commercial Preserves

TABLE I—Anthocyanin and Non-Anthocyanin Absorption at 500 Millimicrons in Varieties of Strawberries Grown at Geneva, N. Y.

Variety	Anthocyanin Absorption (CRE Units)	Non-Anthocyanin Absorption (CRE Units)
Van Rouge	25.2	1.8
July Morn	15.0	2.8
Tenn. Beauty	13.4	0.6
Sparkle	12.5	0.5
Marshall	11.6	0.4
Temple	11.6	0.2
Howard 17	11.2	2.3
Blakemore	10.7	2.1
Culver	10.7	1.8
Dresden	10.5	1.5
Catskill	8.6	2.1
Fairfax	8.5	1.3
Pathfinder	8.2	1.4
Suwanee	7.5	3.6
Average (without Van Rouge)	10.8	1.6

TABLE II—Variation in Anthocyanin Content of Commercial Strawberry Preserves

Code	Color	Storage	A Anthocyanin Absorption (CRE Units)	B Non-anthocyanin Absorption (CRE Units)	A / B
1	Very good*	None	4.9	1.7	2.9
11	Good	None	4.5	2.8	1.6
12	Good	None	3.9	2.3	1.7
13	Good	None	3.8	2.7	1.4
9	Good	None	3.4	2.7	1.3
10	Good*	None	2.9	1.5	1.9
2	Fair*	None	2.3	2.5	0.9
5	Fair*	None	1.7	2.3	0.7
8	Fair*	None	1.5	2.9	0.5
3	Fair*	None	1.3	1.5	0.9
6	Dark red*	None	1.9	2.3	0.8
15	Slightly dark*	None	3.6	2.3	1.6
14	Slightly dark*	None	3.1	2.8	1.1
7	Slightly dark*	None	0.9	2.4	0.4
4	Dark*	None	1.6	3.5	0.5
1 a	Good	2 mo. at 45° F.	3.6	2.3	1.6
1 b	Good	8 mo. at 45° F.	2.7	2.4	1.1
1 c	Good	2 mo. at 65° F.	2.8	2.3	1.2
1 d	Poor	6 mo. at 65° F.	1.2	2.9	0.4
1 e	Poor	2 mo. at 86° F.	0.9	2.5	0.4
1 f	Poor	4 mo. at 86° F.	0.4	2.4	0.2
Tentative limits for well-colored strawberry preserve:			Over 2.0	...	Over 1.0

*Comment by manufacturer

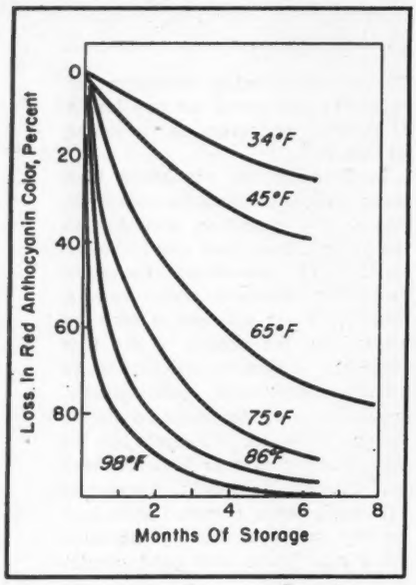


FIG. 1. VARIATIONS in red anthocyanin content—different storage temperatures.

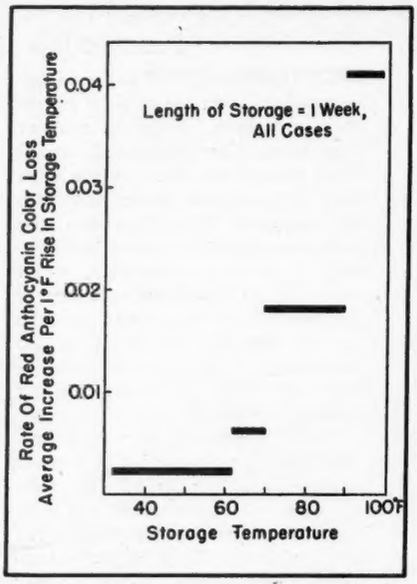


FIG. 2. EFFECT of storage temperature on the rate of red anthocyanin loss.

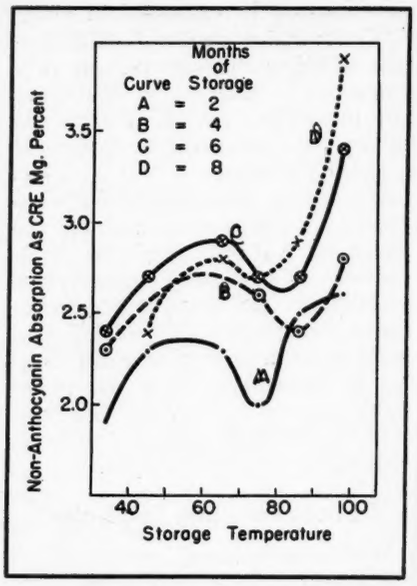


FIG. 3. CHANGES in non-anthocyanin absorption during 2, 4, 6 and 8-month's storage.

value was converted to the actual absorption of the anthocyanin at 500 millimicrons and pH 3.4 This was done by means of calibration curves. The optical density of anthocyanin solutions of known concentrations was measured at 500 millimicrons at pH 3.40 and 2.00. Determinations were made in duplicate, using anthocyanin from three batches of the pigment.

The ratio of the CRE difference between pH 3.40 and pH 2.00 to the actual absorption at 3.40 was 2.23, 2.00, and 2.24. The data listed in this article for anthocyanin content were calculated from the average (2.16) of these values.

The non-anthocyanin absorption value is obtained by subtracting the anthocyanin absorption from the total absorption of the strawberry preparation at 500 millimicrons and pH 3.4.

All the colorimetric data were obtained with a Beckman spectrophotometer, Model DU, using 1-cm. Corex cells. The availability of comparatively inexpensive electric spectrophotometers is a boon to the objective determination of color and of many other important constituents. The photo which heads this article shows a chemist employing this equipment in measuring the color intensity in an extract from strawberry preserves. At her right, on the table, is seen the recently developed Lumetron Colorimeter. This latter device is especially convenient for plant control work, since it is completely portable, uses ordinary test tubes, and is direct-reading for simple operation.

Experimental Procedures

1. *Anthocyanin determinations in fresh strawberries.* It seemed desirable to have some knowledge of the color values of fresh strawberries, and compare the results with those of preserves. Fully ripe strawberries, grown at the Experiment Station under identical climatic and soil conditions, were selected for this work.

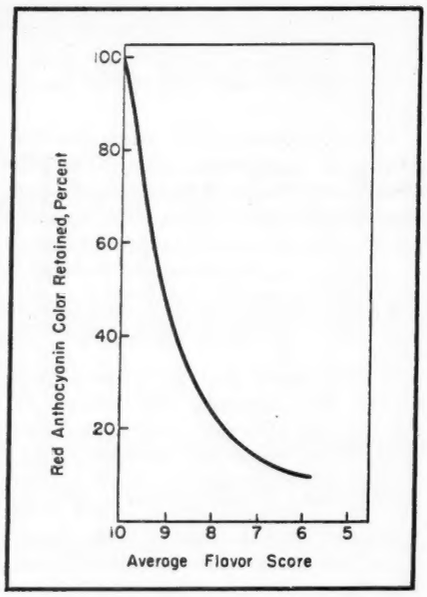


FIG. 4. RELATION of the red color loss to flavor deterioration in the stored product.

2. *Anthocyanin content of some commercial strawberry preserves.* In addition to determining the variations in the anthocyanin content of some fresh strawberries, this constituent was also determined in a number of freshly made commercial strawberry preserves.

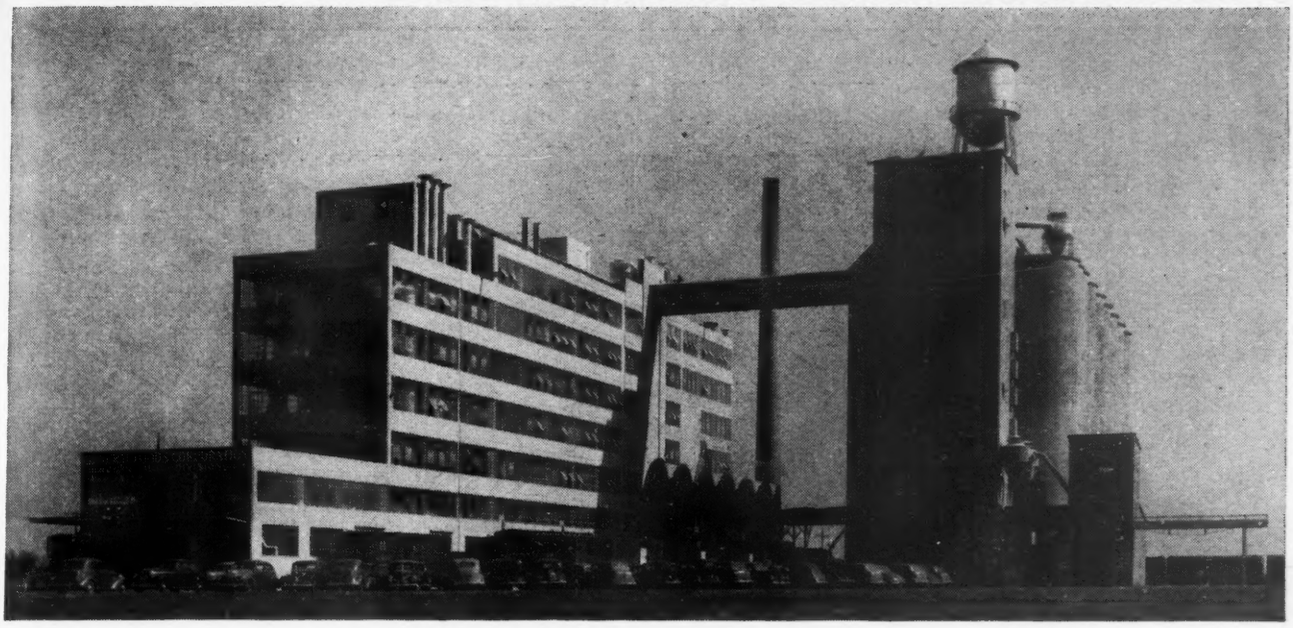
3. *Storage experiments.* Through the cooperation of a large Eastern manufacturer, samples were obtained of freshly made commercial strawberry preserves produced from Oregon-grown Marshall berries, using sucrose, citric acid, and pectin. They were packed in 1-lb. jars. Color determinations were made on three samples, and the results were used as controls (see Code No. 1, Table II).

Other samples were stored at the following temperatures: 34 deg. F. ± 3 deg. F., 45 deg. F. ± 2 deg. F., 65 deg. F. ± 2 deg. F., 75 deg. F. ± 3 deg. F., 86 deg. F. ± 2 deg. F., and 98 deg. ± 1 deg. F. Color was determined monthly on the 98-deg. F. samples and bi-monthly on samples held at other temperatures. Results are shown graphically in Fig. 1. On the other hand, when the same data are plotted as the logarithms of the percent anthocyanin retained against storage lengths, straight lines are obtained. These lines do not go through the point of origin, with the exception of that for the lowest storage temperature. However, when these values for any given length of storage or the monomolecular reaction constants calculated from the data used in Fig. 1 are plotted against storage temperature, a break in these otherwise straight lines invariably occurs around 65 deg. F.

Similar results were obtained in the limited holding test previously reported[6], and in additional tests with six other lots of preserves, representing different manufacturers or batches. To determine changes in anthocyanin content in the early phases of deterioration during storage, a set of the same preserves used for Fig. 1 were later subjected to a separate holding test of one week's duration. Results are shown in Fig. 2. The trends in the non-anthocyanin absorption at 500 millicrons in strawberry preserves stored at different temperatures appear in Fig. 3.

4. *Flavor determinations.* Extensive

(*Continued on page* 214)



This mill receives, cleans and stores 60 carloads of corn daily. Twenty-two carloads are processed to make all types of granulations, flakes, oil and feed through—

Continuous Dry Corn Milling

By J. J. MULLEN, General Manager Corn Meal Division
General Foods Corp., Kankakee, Ill.

WHETHER the end product of the Corn Mill Division, General Foods Corp., Kankakee, Ill., be flakes, grits, meal, flour, germ or oil, it is made by disassembling the corn kernel in a continuous manner.

The primary operations are hulling and degerminating, cracking and grinding, screening and sifting, pressing and filtering. Secondary or supplementary operations are conveying, cleaning, weighing, tempering, heating, cooling, flaking, drying, cutting and bagging or packing.

Controls at Many Points

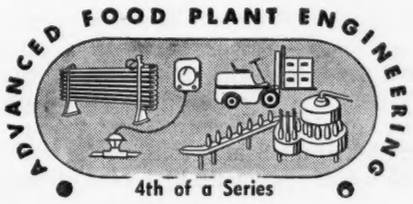
Each step is under some type of control to assure uniformity—in plant operation, in product quality, and in protection against contamination or deterioration.

These controls are imposed by mechanical feeders, magnetic separators, temperature indicators and recorders, automatic valves, vibrators, adjustable speed conveyors and suction fans.

In some instances the same type of control is exercised at several places in the production line as exemplified by the magnetic separators at five stations shown on the flow diagram. Further, these controls are continuously and systematically calibrated and checked by a master-control laboratory manned by four technologists and technicians under the supervision of a resident chief chemist.

The controls begin with receipt of the corn into elevator storage. Here it is fed into the receiving cleaners at a rate that permits removal of extraneous objects larger than corn kernels by screening, and chaff and dust by aspirating. Controls end with the shipping of finished products.

Upon receipt, any corn having a moisture content over 15 percent is dried to that content. This is done in column-type bins using heated air. The corn is then cooled to 70 deg. F. to prevent bin heating and development of mustiness. Storage bins are equipped with temperature indicators at each 5 ft. level. Transfer of corn from one bin to another and from elevator to mill storage aids in maintaining the temperature of the grain in the preferred range during storage.



Magnetic separators, of the belt and spout types, are located at strategic places in the mill. They remove tramp iron and steel likely to damage mills, sifters or rolls, or likely to be packaged with the finished product. Stones and other non-magnetic extraneous objects, not screened out during receiving and second stage or mill cleaning, are removed by gravity separators. Mechanical scrubbing, or friction scouring plus air suction, frees the grain of adhering dust, kernel tips and chaff.

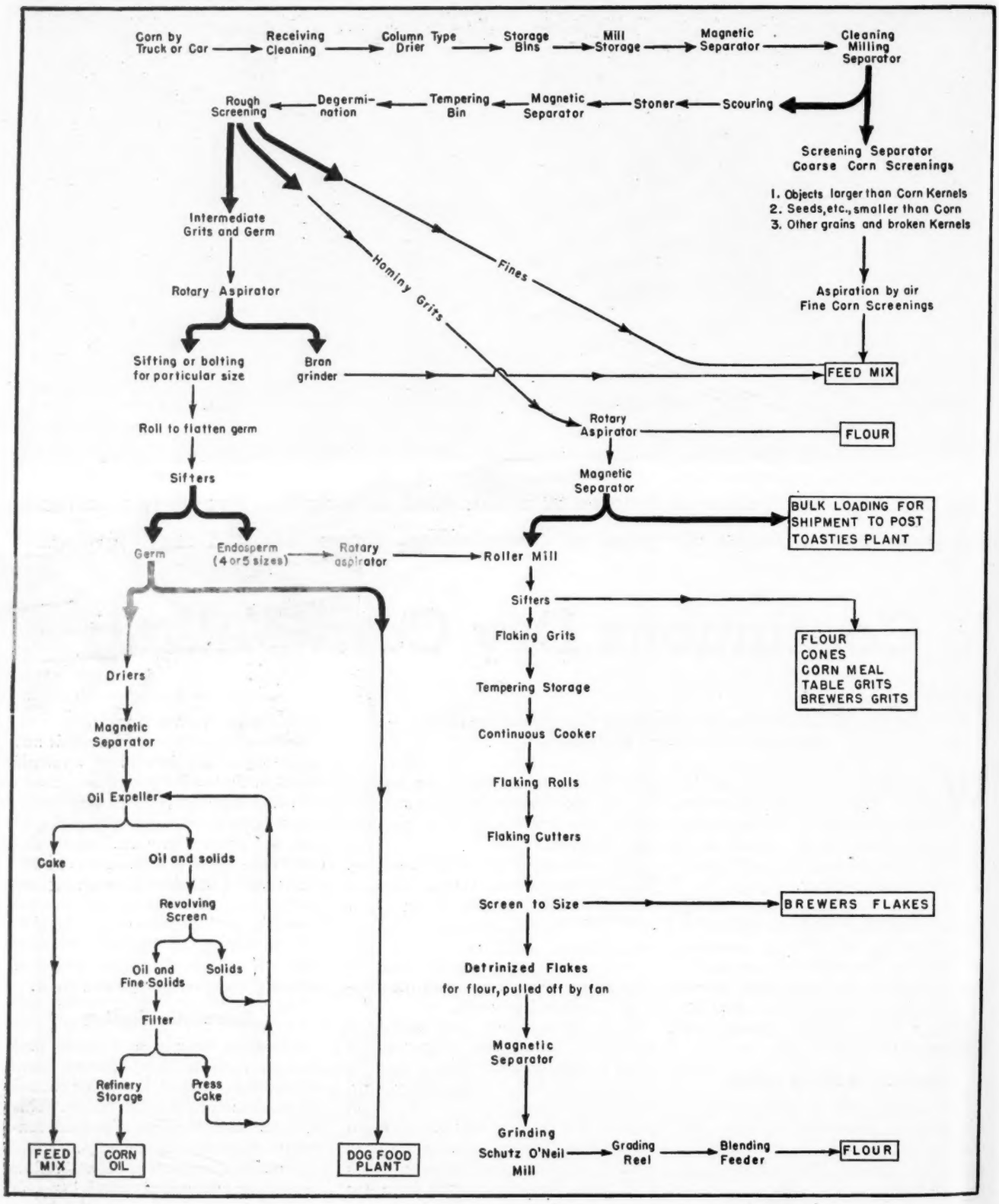
Automatic Scaling

Automatic scaling aids mechanical feed to regulate flow of corn from mill storage to and through processing at a rate of 1,500 bu. per hr. This does not underfeed or over-load conveying or processing units.

Automatic regulation of water flow through a mechanical tempering unit gives the corn the desired 21 percent surface moisture preliminary to degermination. Reduction of moisture content, to 15 percent after degermination is under automatic instrument control of steam pressure in the driers. This drying, at 170 deg. F., also destroys molds, yeasts and insect eggs as a step in lessening the likelihood of fungus damage and insect infestation in the finished products.

Aspiration for the removal of fines,

Corn is Converted to Many Products in Mammoth Mill



bran particles, bees wings and the like, also removes dust, kernel tips and similar light weight objects whose presence in hominy, grits and flour would be objectionable.

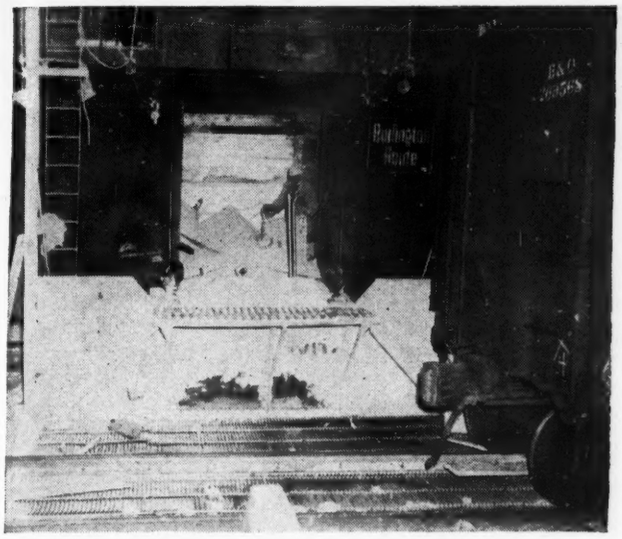
Preliminary to flaking, grits with the regulated addition of water are moved through the continuous cookers at an adjustable rate by a paddle-type conveyor while subjected to controlled steam pressure heat.

The desired flaking-roll heat is obtained by adjustable open flame gas burners. It is checked by a surface pyrometer indicator to assure adequate flaking temperature without overheating. Fans draw the flakes downward and away from the rolls in a manner to minimize scorching and danger of fire. An indirect control over the operation of the flaking rolls results from the use of systematically cooled oil for lubrication of the flaking roll bearings.

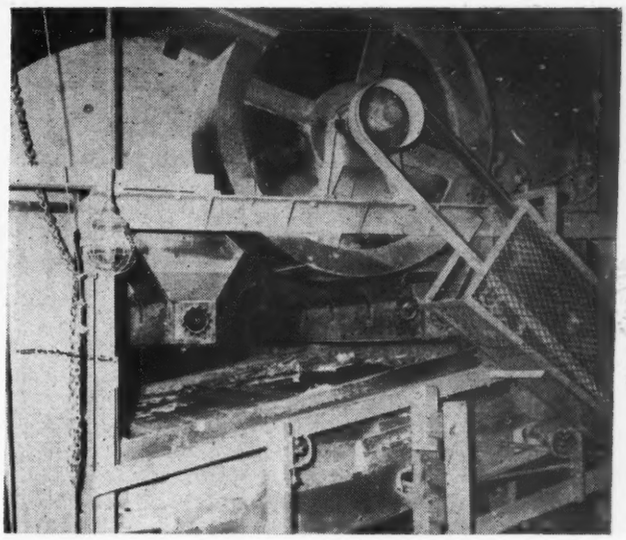
Flakes leaving the rolls are too large for fermentation use. Before bagging they are run through cutters and over screens for grading according to size.

Other finished products, such as hominy grits for breakfast cereal flaking, table grits, meal, flour, germ and oil, are likewise made and handled in a controlled, continuous manner.

Grain is Received, Cleaned, Stored and Delivered to Processing

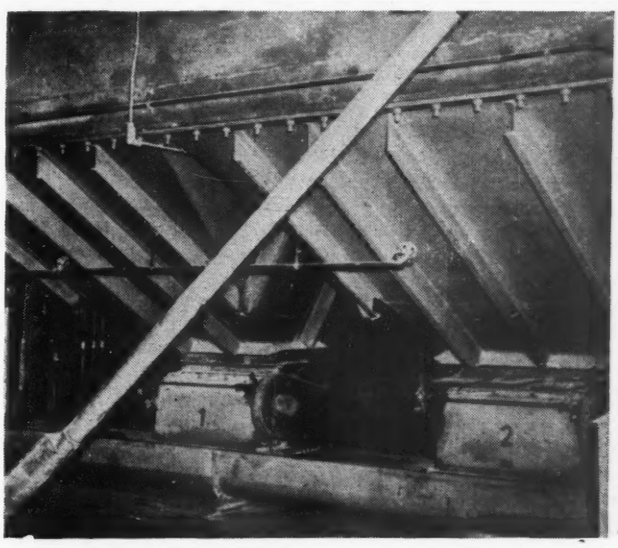


1. CORN is unloaded from box cars into grid-covered dump pits with aid of cable-drawn scoops.

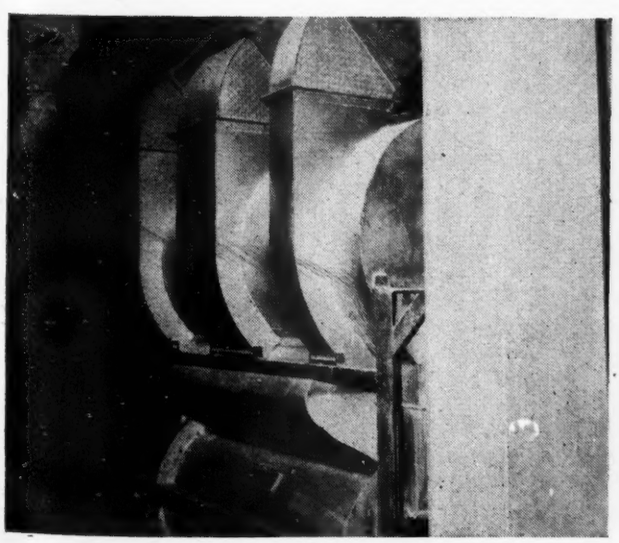


2. HUSKS, cobs, sticks and bees wings are removed from 6,000 bushels of corn per hour by receiving cleaners.

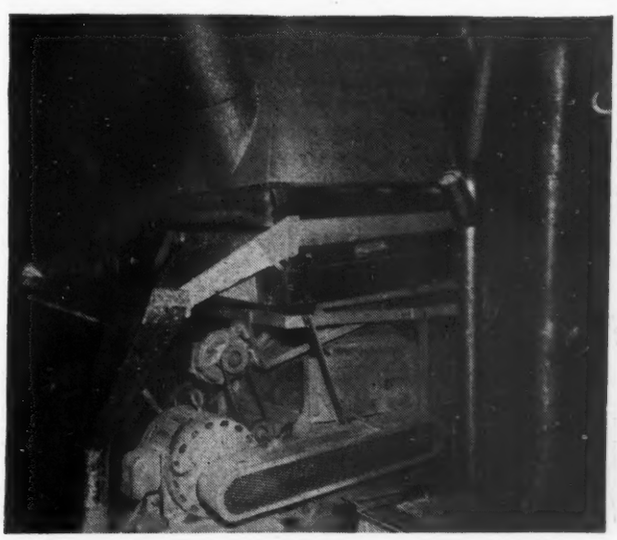
3. DUST is removed as the corn is delivered from bucket conveyor to 30-in. distributor belt.



4. ADJUSTABLE FEEDERS deliver corn from mill storage bins to processing at rate of 1,500 bu. per hr.

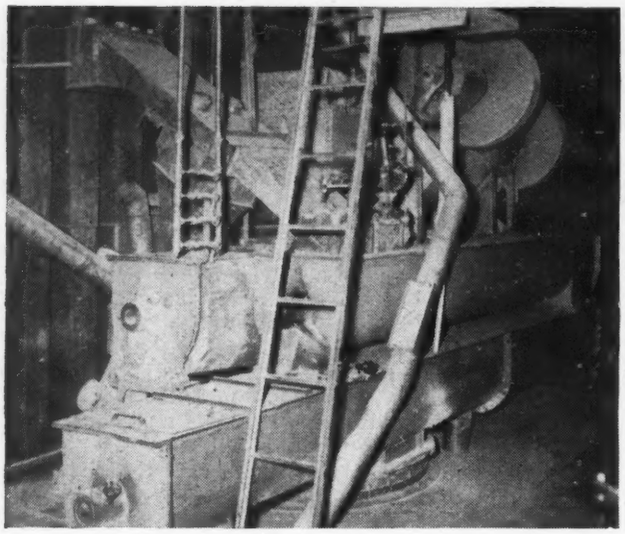


5. ADHERING DUST is removed from kernel tips and surfaces by scouring or friction cleaning.

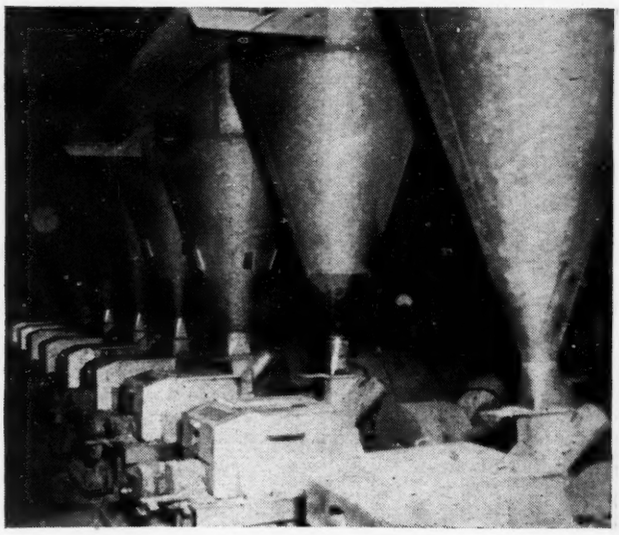


6. STONES are separated from cleaned corn by vibrating gravity separators. Corn then enters magnetic separator.

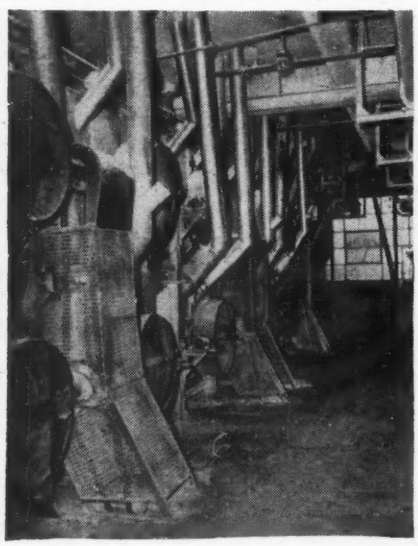
Grains are Tempered, Degerminated, Dried and Ground . . .



7. **GRAINS** are tempered by adding surface moisture and holding for 1½ hours to obtain penetration.

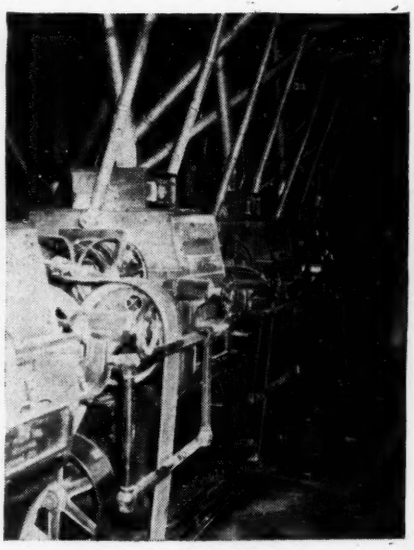


8. **DEGERMINATION** releases moisture-toughened germ and removes shell from cracked kernel.

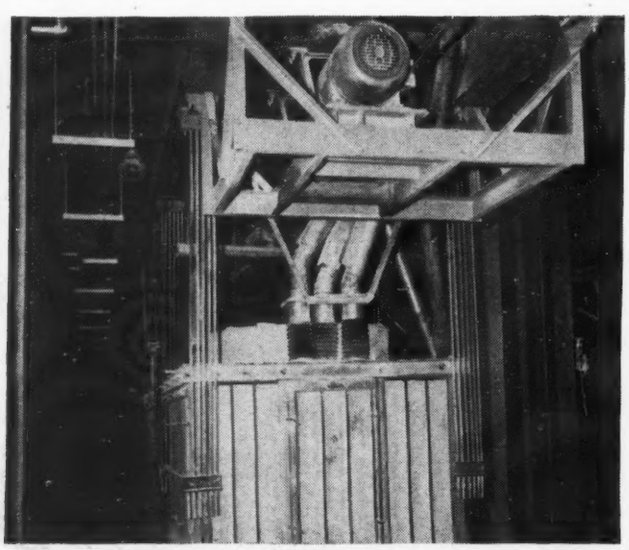


9. **KERNELS** are dried to 15 percent moisture before screening.

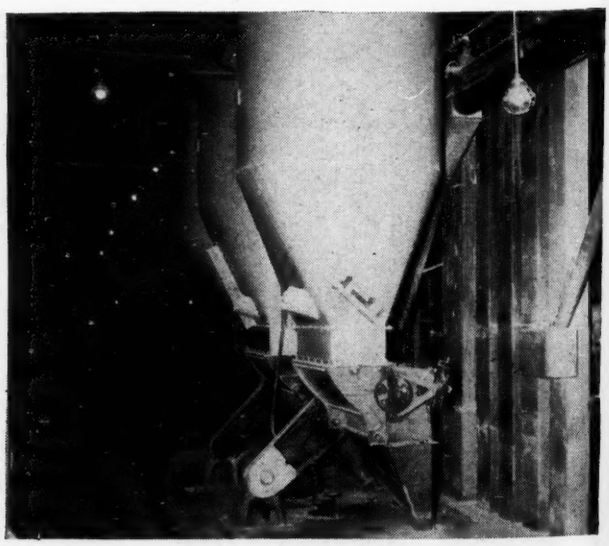
10. **ROTARY SEPARATORS** remove fines from grits and germ.



11. **ROLLER MILLS** reduce hominy grits to finer granulation.

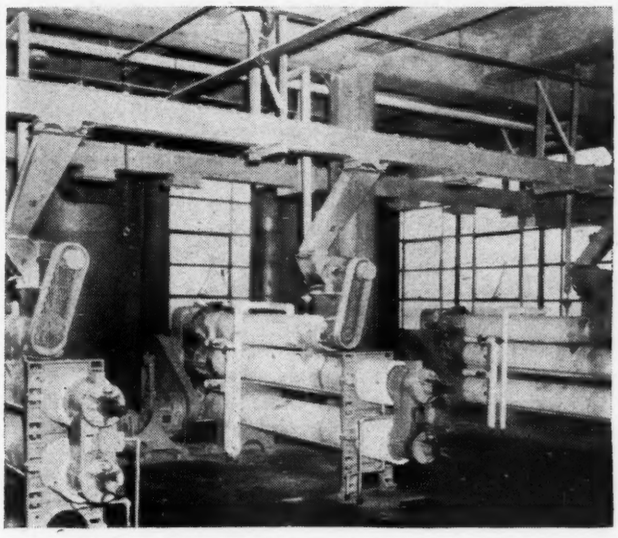


12. **SIFTING** classifies the milled hominy grits according to particle size. Flaking grits go to tempering bins.

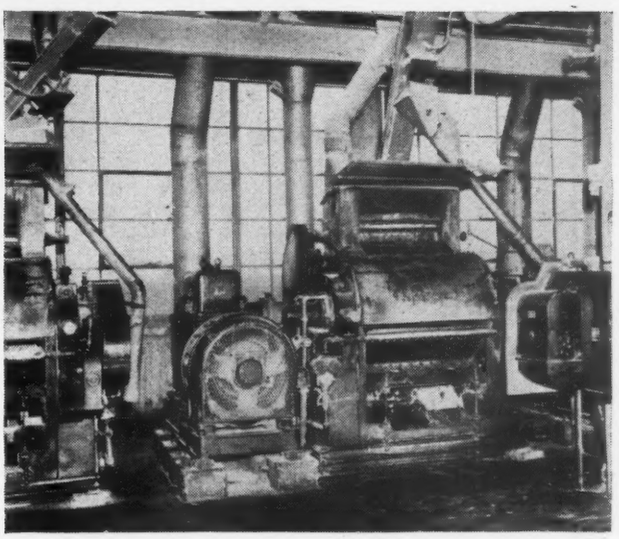


13. **TEMPERED FLAKING GRITS** are drawn from tempering storage under controlled feed.

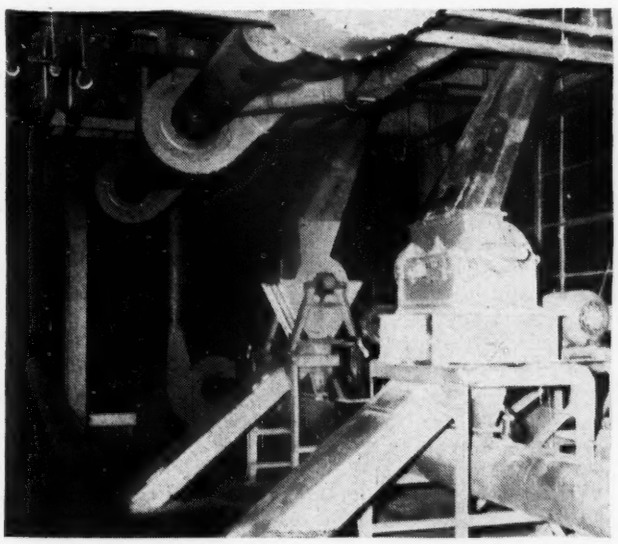
. . . Then Cooked, Flaked, Graded and Bagged



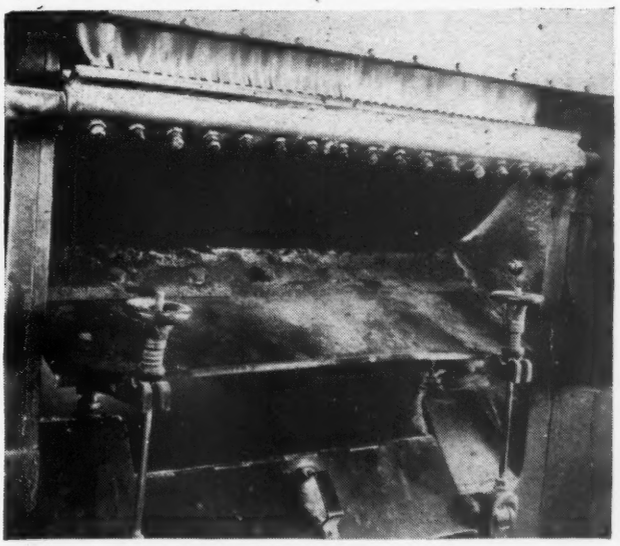
14. **CONTINUOUS COOKING** at 140 to 160 deg. F. gelatinizes starch content preparatory to flaking.



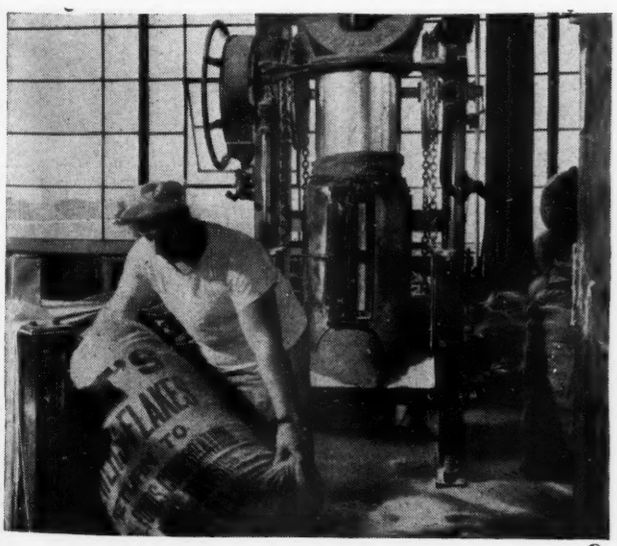
15. **GRITS** are flaked on rolls heated to between 500 and 600 deg F. with open gas flames.



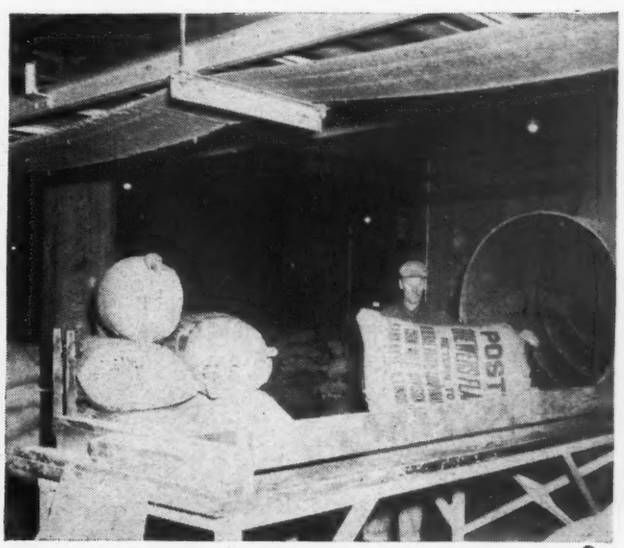
16. **LARGE FLAKES** are reduced to the desired size by rotary knives, then graded by screening.



17. **CLOSE-UP VIEW** of flaking roll showing open gas flame playing directly upon it.

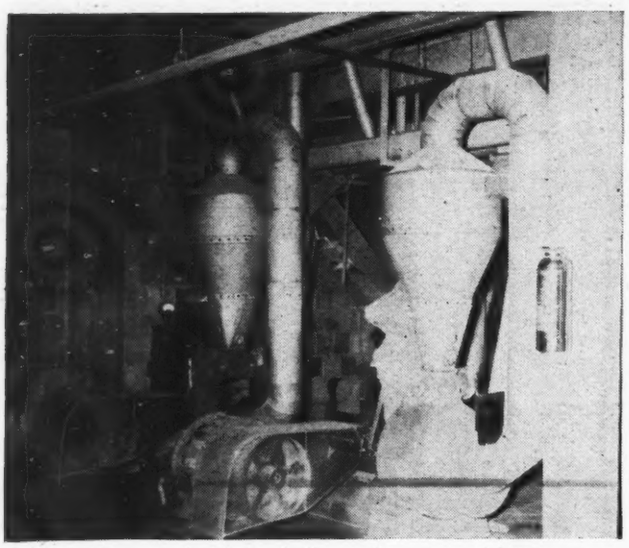


18. **SCREW PACKERS** fill 40 to 100 pounds into each bag depending upon density of the flakes.

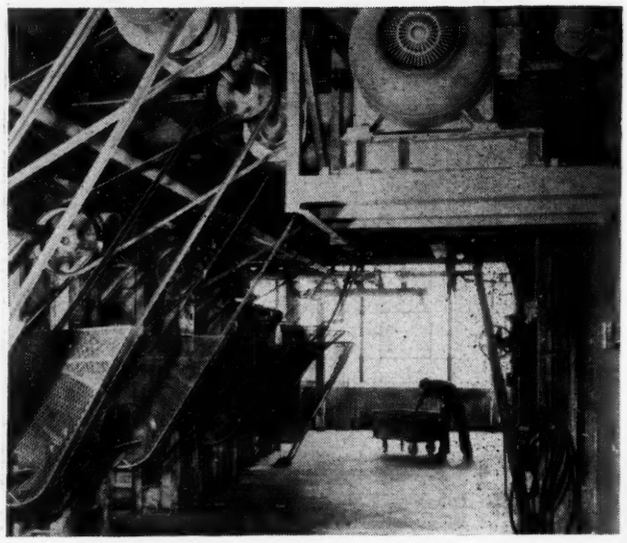


19. **BAGGED FLAKES** are conveyed from filling room to shipping storage in metal chutes.

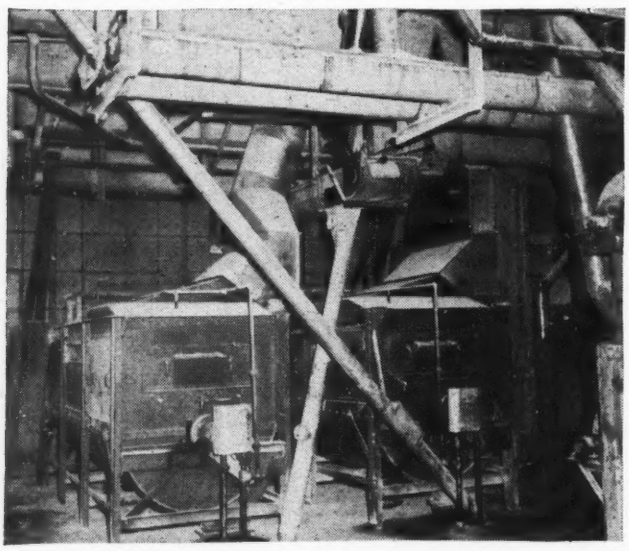
Germ is Separated from Endosperm, Deoiled, Ground for Feed



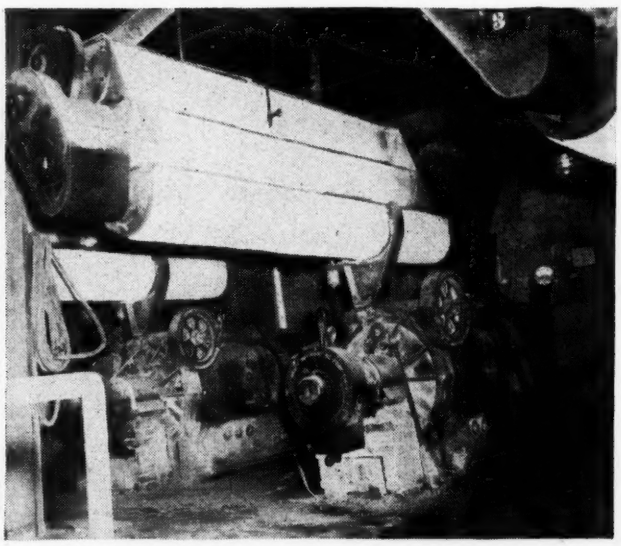
20. DEXTRINIZED flakes are ground to flour fineness in friction plate mills.



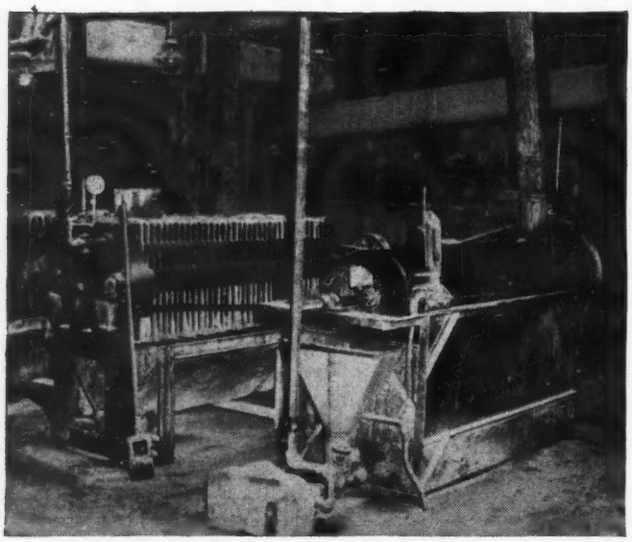
21. GERM STOCK is separated from endosperm of intermediate grits by reel sifters.



22. GERMS are freed of tempering moisture content in revolving heated drums.



23. EXPELLER-TYPE PRESSES convert germ into low-fat cake and oil containing particles of germ solids.



24. SUSPENDED SOLIDS are removed from oil in revolving drum (foreground). Oil is clarified in filter presses (rear).

25. GROUND EXPELLER CAKE, bran and fines are bagged and sold for animal feed.

Panel-Controlled Conveyor Line Sorts Automatically

MECHANICAL segregation of containers is now made possible by a new automatic unit. The machine will expedite the task of handling filled boxes of lemons in the plant of the Oxnard Citrus Assn., Oxnard, Cal. Start of operation is planned for early Fall. Food Machinery Corp. developed the machine and is extending the equipment's use to other branches of the food industry.

Fundamentally, the apparatus comprises a conveying system with several "switch" stations—the number according to needs. The operator at the control panel presses respective buttons, according to size, grade, brand, or color of containers passing his station. Then through electric relays, containers coming along the line are shunted off at the correct point, and stacked, later to be delivered to storage. Once the operator has made his selection at the control panel, segregation by the machine is automatic.

This special segregating equipment, designed to be coordinated with other production-line units, is intended for use by packing houses, canneries, and warehouses.

In recent test runs, boxes of lemons were sorted, stacked 12 high, and then sent to the storage rooms, for final ripening. Using this equipment, one operator can handle 30 boxes a minute. Efficient operation of the segregator is limited only by the ability of the operator to identify the boxes and press the correct control buttons.

How Device Works

In the handling of lemons, boxes are fed single file (from the color sorting tables) onto the segregating line by feed conveyor. Each box then passes through a control zone—the operator's station—near the receiving end of the line.

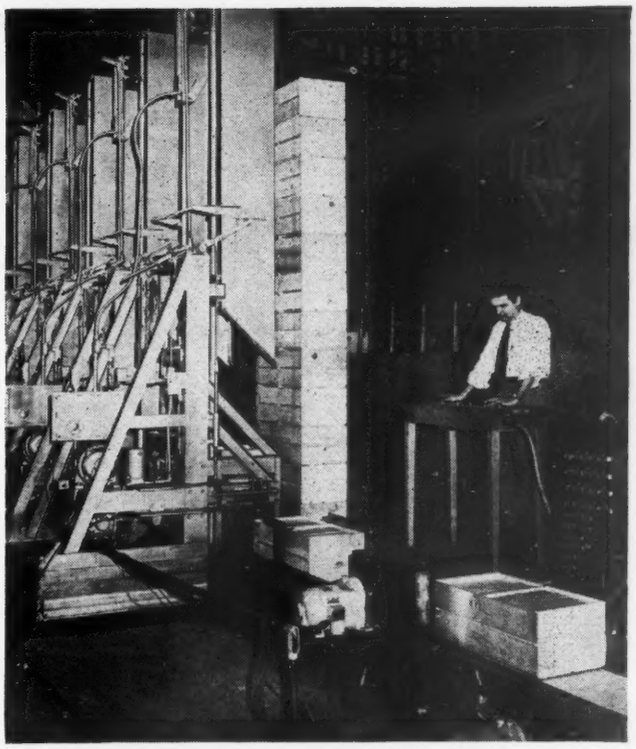
Here, the operator identifies the box at a glance (see top picture), then presses the button controlling the sorting operation. For example, he might press Button 1 for tree-ripe lemons, Button 2 for light green, Button 3 for silver, and Button 4 for any other color.

A series of time-delay relays (in cabinet, right in top picture) activates diverting mechanisms at the grouping points after predetermined intervals. The selection, made by the operator when the box passes the control station, becomes effective when the box reaches the correct diverting point—that is, after the exact time interval needed for the box to reach this stage. It is not necessary to wait for each container to clear; selection can be made in any order as the boxes pass the control zone.

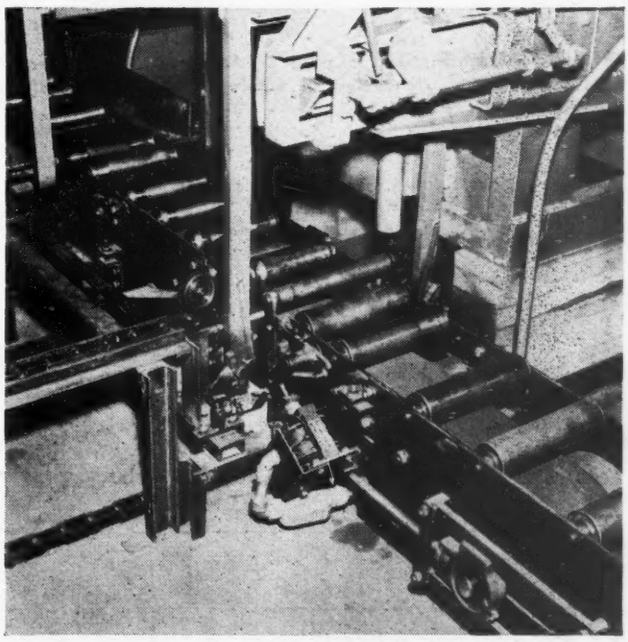
The push button operates a solenoid (see center picture) that sets the correct gate to divert the box to the desired group. Where there are five different classification of boxs, four push buttons may be used to sort boxes 1, 2, 3, and 4, with No. 5 boxes passing all diverting points and being grouped at the end of the line. The accompanying diagram-picture illustrates the operation, also shows how the line may be used to route boxes to different floors.

After the box is diverted, it is taken by a stacker and automatically lifted into its group. When it becomes 12 high, the stack is released by the machine and removed by a conveyor to its proper place in the storage room.

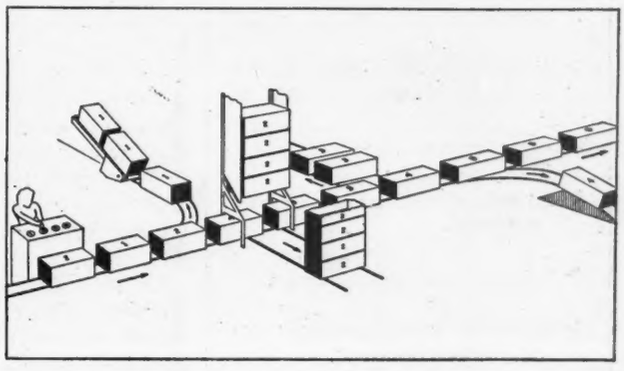
The stacking portion of the equipment does a job that has often been difficult and dangerous when done by hand.



When He Presses Buttons . . .



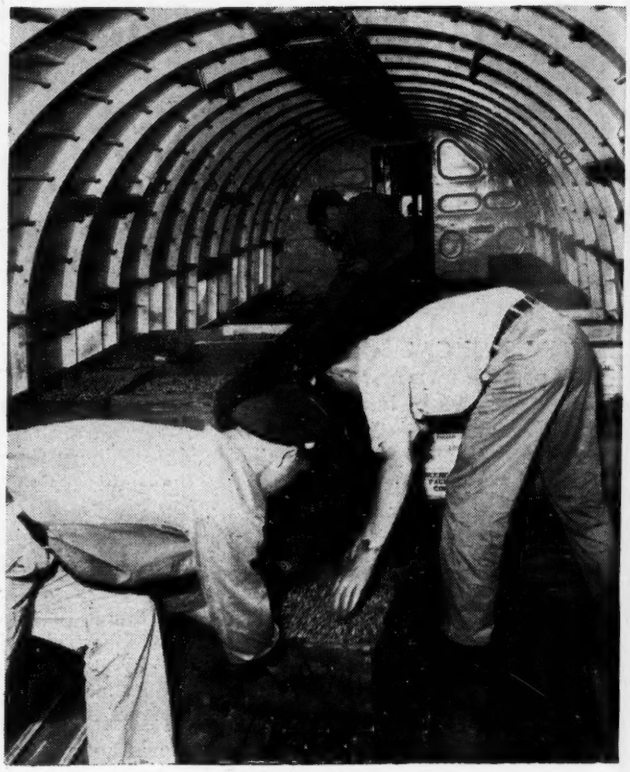
. . . Relay Mechanisms Are Activated . . .



. . . To Sort and Stack Boxes

FIELD TO . . .

AFTER peas are mechanically cut by harvesters in Bloomsburg, Pa., region, they are hulled in viners adjacent to the fields.



THEN the peas are cleaned, washed, packed in wooden lug boxes holding 40 lb. of peas, and loaded aboard a DC-3 transport.

Air Shipments of Peas Extend Freezer's Operations

Plant lengthens its packing season by using twin-engine Douglas DC-3 planes, hauling three to four tons of the raw material on each trip

Grower-to-Processor Air Hauls Can—

- **Increase plant's working radius.**
- **Expand a plant's working period —earlier opening, later closing.**
- **Lower transport-labor costs.**
- **Cut risks of unfavorable growing conditions.**
- **Reduce shrinkage of produce.**
- **Enable new diversification in kinds of produce processed.**

TRANSPORT BY AIR of shelled green peas has enabled Seabrook Farms, Bridgeton, N. J., one of world's largest grower-freezers to enlarge its frozen pea-packing operation. The peas—three to four tons per trip —have been flown 135 miles from Bloomsburg, Pa., where the season is ten days to two weeks later than in the South Jersey area.

Shipment of 100 tons of peas by air was tried out last year by Seabrook in joint operations with the Cooperative G. L. F., which has been canning peas for several years in the Bloomsburg region. These shipments, taking less than an hour from airport to airport, made it possible for the food freezer to extend his pea-packing season approximately 18 percent. Success of last year's trial runs resulted in Farms Manager John M. Seabrook's decision to continue air shipments this year—and on a larger scale.

This season, about 275 acres of peas at Bloomsburg have been marked for air-haul to Seabrook's freezing plant. And while it is granted that this represents only a fraction of the peas grown in this area and that the major portion is canned by the Cooperative, nevertheless the development is significant in the possibilities thus opened for greater flexibility of operation by frozen food packers.

The peas are grown, harvested, and vined within a 10-mile radius of Bloomsburg. Only those peas that are

ARRIVING at Seabrook airport, 135 miles away, boxes of peas are loaded on trucks waiting at airstrip and rushed to plant.

. . . FREEZER

FOLLOWING grading, blanching, sorting, and packaging, peas are placed in trays and put into freezer cabinets for 1½ hours.

graded "fancy" are shipped by air.

Trucking distance from the plant at Bloomsburg to the municipal airport is about 1¾ miles. The average elapsed time from the viners to processing room is 2½ hours.

This season's schedule, started around June 25, called for 100 flights, using twin-engine Douglas DC-3 planes as carriers. Haulage is subleased to firms by an airfreight forwarding company. These firms synchronize the shipment of peas with that of other commodities, making shipment of peas a routine air haul.

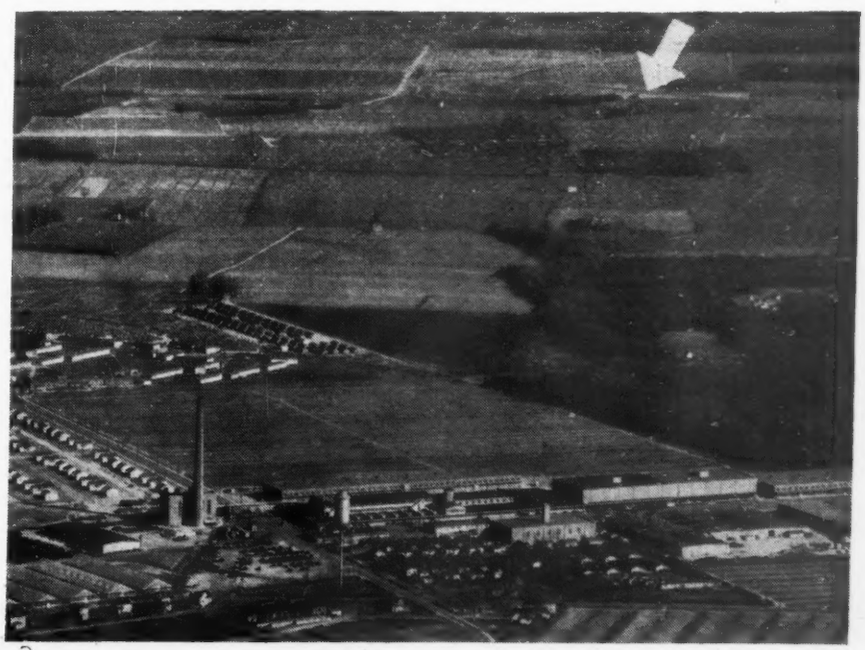
The haulage charge is based upon the net weight of the peas at a specific price per pound. Cost of shipping the peas by air to Seabrook Farms—with consideration of the distance traveled and the net and tare weights of the boxes of peas—is about 2½c. per lb.

Factors to Consider

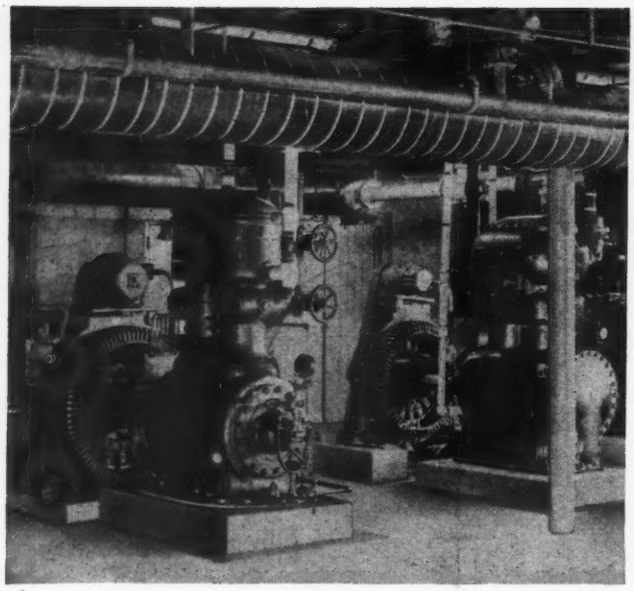
While air transport costs more than other methods of shipping the peas, there are several factors that compensate: (1) Extension of plant's working radius; (2) expansion of the working period, with earlier opening, later closing; (3) lower labor costs during shipment, (4) less risks attributed to unfavorable growing conditions, (5) less shrinkage of the raw material shipped, and (6) new opportunities for diversifying produce handled.

It is entirely possible to transport peas by air from areas even more distant than Bloomsburg in order to further extend the pea-packing season. For example, the season might be started earlier by shipping this produce from areas south of Bridgeton. Also, the season could be further lengthened by flying the peas from areas north of Bloomsburg.

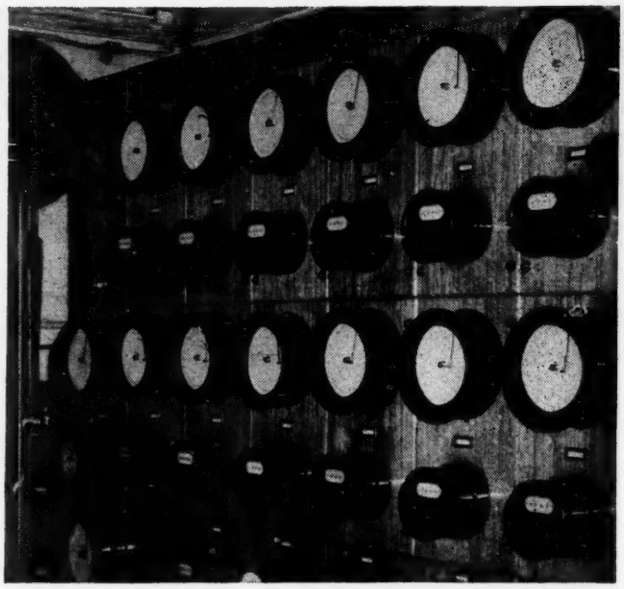
Before making any specific decision to employ air transport, however, a plant should carefully consider such key factors as: Cost of trucking to and from the plane, air terminal facilities, overhead of plant doing the packing, and manner in which product can be integrated into the operations of the plant.



PROXIMITY of airstrip (arrow) to Seabrook plant (foreground) is graphically illustrated by this airview. There is speedy strip-to-plant trucking of peas, eliminating delays.



Booster Compressors . . .



. . . Better Power Factors . . .

Lower Operating Costs

By R. J. RAMSEY, Ramsey Laboratories, Cleveland, Ohio

LARGE economies in ice cream plant refrigeration costs may be effected by the application of modern air conditioning methods to dehumidification and circulation of air in hardening rooms, supported by the proper use of booster compressors and correction of bad power factors.

The great day-to-day and season-to-season fluctuations in refrigeration load—operations running from 25 to 100 percent of peak capacity—present extremely difficult design problems. Yet there is a solution, and it will mean real savings to the plant operator.

One of the first refrigeration problems encountered is the cooling of ice cream mix. A normal mix contains approximately 12 percent butterfat, 11 percent milk solids not fat, 15 percent sugar and 0.5 percent stabilizers and emulsifying agents to improve the body and texture of the frozen ice cream. This mix is not as difficult to cool as heavy cream, but is heavier than milk and requires more cooling surface.

Other mixes contain 10, 14, 16, 18, and even as high as 22 percent fat. The high fat mixes are more viscous and harder to cool than the normal mix given above.

Because of these extreme differences, care must be exercised in the selection of mechanical equipment to do the cooling job. Use of the plate cooler is increasing rapidly in the dairy industry because of its compactness, ease of expandibility of surface and its possible use in connection with latent heat plants.

The high viscosity of ice cream mixes, however, frequently makes the pressure through a plate cooler very great. Undue strain is placed on the gaskets. The mix under such conditions is not always cooled as low as it should be, thus requiring some auxiliary cooling in the storage vats. It is safer practice, therefore, to use some sort of surface cooling equipment, such as the direct expansion cabinet cooler.

Ice Cream Freezing

The process of ice cream freezing is, briefly, as follows: Cold ice cream mix, at 33 to 40 deg. F., is taken to an ice cream freezer and rapidly cooled with vigorous agitation—to approximately 24½ deg. in batch freezers, or 22 deg. in continuous freezers. The freezing point of ice cream mix varies greatly with the ingredients used, but is in the neighborhood of 27 deg. F. In the freezer, the mix is supercooled and ice crystals soon begin to form. Within a relatively few minutes, as much of the water has been frozen as is practical considering the viscosity of the semi-frozen product.

In batch freezers, only about one-third of the water is frozen when the mix comes from the freezer. In the continuous freezer approximately 50 percent of the water is frozen.

When ice cream is hardened rapidly, the ice crystals are small, the texture is smooth, and the product appears richer. Fluctuating temperatures cause variations in the plastic viscosity of the ice cream, resulting in sandiness or crystallization of lactose, shrinkage, and other defects associated with poor quality. To be safe, therefore, all hardening rooms should be calculated for –20 deg. F., with a separate automatic compressor for the night load.

Let us consider briefly the job to be done in the hardening room: When the ice cream emerges from continuous freezers at approximately 22 deg. F., only 50 percent of the free moisture is frozen. The rest of the job must be done in the hardening room. At 0 deg. we find only 82 percent of the water completely frozen, even after several days' storage. At lower temperatures somewhat larger quantities are frozen, but at no point do we reach complete freezing of all the water in the ice cream.

For the sake of this discussion, let us assume that 50 percent of the water is frozen in the freezer and that an additional 35 percent must be frozen in the hardening room. The hardening room must be equipped with enough refrigerating capacity to maintain the temperature of the room and to freeze the 35 percent water in the ice cream.

Some excellent experimental work has been done by Tracy and McCown† to aid us in analyzing freezing prob-

† P. H. Tracy and C. Y. McCown, *Journal of Dairy Science*, p. 47 Vol 17, January 1934.

. . . And Advance-Design Hardening Rooms Will —

In the Ice Cream Plant*

lems. It might be interesting to discuss certain of their findings:

Rate of Hardening Ice Cream. In one study, the hardening rate of ice cream was determined by thermocouples variously placed at the edge, at a point 2¼ in. from the edge, and in the center of the cans. The ice cream was placed in a hardening room at –6 to –22 deg. F. Temperatures were taken each hour to determine the rate of hardening at various points in the can. The temperature at the edge of the can started dropping immediately. At 2¼ in. from the edge, it did not start dropping appreciably until after 3 hr. And the portion in the center remained at almost constant temperature for approximately 5 hr. Even after 12 hr., the ice cream in the center of the can had not reached 0 deg. F.

Sensible and Latent Heat

The rate of hardening ice cream depends upon the amount of heat to be removed and the rapidity with which the heat is conducted away from the frozen product. The heat removed in the hardening room consists of the sensible heat of the ice cream and the latent heat of the water that is frozen into ice during the hardening period.

The percentage of unfrozen water is a function of the temperature of the ice cream. Therefore, the drawing temperature at the freezer is directly related to the percentage of water frozen and to the time required to harden the ice cream. When ice cream is drawn from a batch freezer at approximately 24½ deg. F., 35 percent of the water is frozen. When ice cream is drawn from a continuous freezer at 22 deg., 52 percent of the water is frozen.

In the hardening room, continuously frozen ice cream hardens approximately 2 hr. faster than that from batch freezers. In other words, a difference of 2½ deg. at the beginning of the hardening period means a saving of approximately 16 percent of the time required to reach 0 deg. F. in the hardening room.

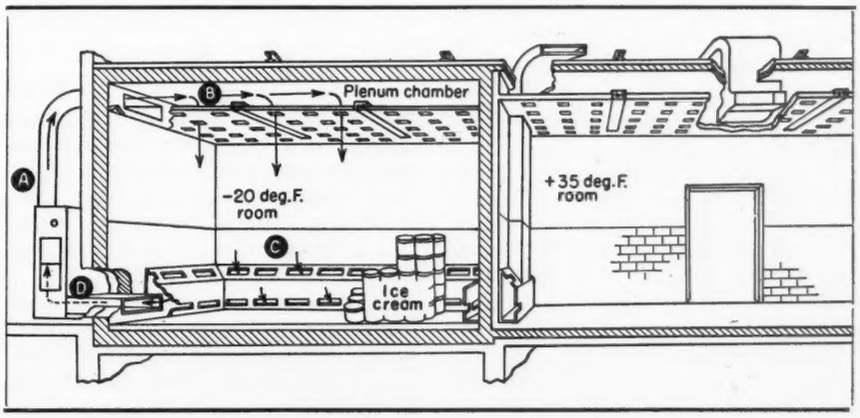
The percentage of overrun, or air incorporated in the ice cream, has been found to have no appreciable effect upon the rate of hardening.

Ice cream varies considerably in composition, and these variations result in differences in drawing temperatures and hardening rates.

Effect of Increased Air Velocity. During the past few years, extensive use has been made of electric fans to increase the air velocity in the hardening room and thereby speed the rate of hardening. This saving in hardening time occasionally amounts to 50 percent for 5-gal. cans. And for smaller packages even greater savings are made.

These tests would appear to indicate

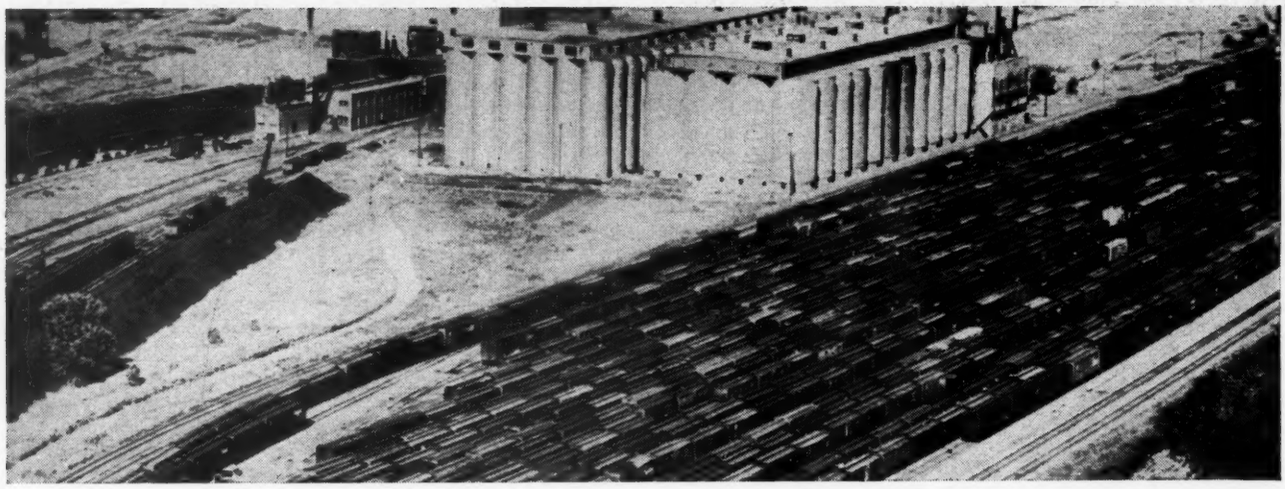
(*Continued on page* 210)



How Cold Rooms are Refrigerated

CROSS SECTION shows how air is circulated in ice cream hardening room. From low temperature unit (A), air is forced through duct into plenum chamber (B), where it is distributed into the hardening room below. Through return duct (C), air is drawn back to unit (A) to be re-cooled and recirculated, as shown by dotted-line arrow at (D). Dairy products storage, right, is similarly cooled.

*This article is a sequel to the author's "Reducing Refrigeration Costs In The Dairy Plant," *Food Industries*, Page 80, May, 1948.



1948 Wheat Crop Characteristics

Hard Wheat Survey Indicates:

- ▸Huge Harvest and Better Strains

And Analysis Shows:

- ▸Protein—High and Mellow
- ▸Bleaching Requirements—Lower
- ▸Milling Properties—Excellent
- ▸Fermentation Periods—Unchanged

By D. B. PRATT, JR., B. A. Eckhart Milling Co., Chicago

THIS YEAR the bread-basket states of the Middle West and Southwest are bringing to market another bumper wheat crop. Early reports, true enough, had indicated a large crop—but nothing like the almost 900,000,000 bu. now anticipated by most experts.

A miracle of Nature in the form of bountiful rains when needed, plus double—and sometimes triple—"ears" on dwarfed stalks in parts of Oklahoma are the big factor in this unexpected boost.

Harvesting in many places has been a struggle against time. The crop "exploded." Rainfall at the time Kansas wheat should have been cut delayed combining operations almost two weeks. As a result, everything ripened ahead of the combine crews. All of Kansas, Nebraska, Missouri and even southern Illinois crops were ready for harvest at almost the same time. Wheat moved to terminal markets so rapidly that in some places embargoes against grain shipments were established.

Quality Analyzed

Against the backdrop of the huge harvest, millers and bakers have busied themselves in laboratory investigations into the quality of the wheat as it applies to their respective fields. Data have now accumulated to the extent that a clear picture of the quality of the harvest has been obtained.

Indications at present are that quality has followed in the footsteps of the work of the various wheat improvement associations. New varieties in Texas, Oklahoma and Kansas have assumed a prominent position in the crop statistics this year. In some instances over 50 percent of the harvested acreage has been of the newer strains of grain, such as Pawnee and Comanche. Percentagewise, the obnoxious varieties (Chieftan, Redchief, and certain Blackhull strains) are smaller than in many years.

Protein Strength Good

Laboratory studies of the new wheat point to a somewhat higher average protein content than the previous crop. This will reflect itself in higher protein standards for bakery flour. The quality of the gluten is excellent.

Hand-in-hand with the higher protein content, the dough absorptions are higher—about ½ to 1 percent. Mixing time is somewhat shorter—1 to 2 min. This is due to the larger percentages of the new varieties in the harvest, inasmuch as all of these require less time to develop into doughs.

Mixing tolerance is better than in previous harvests. Recording mixer studies indicate about 10 percent greater tolerance to overmixing.

Although protein content is higher than it has been for several years, the fermentation periods will remain unchanged. Higher protein contents are offset by a more rapid development in fermentation of the newer varieties. Bakers will find no difficulties in changing from old to new crop flours.

Due to the delay in harvest, the wheat is much more mature than usual and the flour has none of the "green" characteristics so evident during the past several years. Proof time (pan fermentation) remains the same.

Response to Oxidizing Agents

Bleaching requirements of the new wheat are somewhat lower than for last year's crop. The protein is considerably more mellow, thus requires less of the maturing agents. Bromates produce a quick response; somewhat

(*Continued on page 212*)

EDITORIALS

COMMENT AND OPINIONS

Salt Water Invasion

WATER scarcity in California has had national attention lately. Now come the government experts of U. S. Geological Survey to tell of further water troubles of the West Coast.

Salt water from the ocean is invading many of the fresh water areas near the Coast between Long Beach and Santa Monica. Where pumping has been as much as 90,000 acre feet in recent years, fresh ground water has been withdrawn twice as fast as the normal underground recharging rate. Naturally this is serious for urban supply, for industry, and for agriculture.

Even food establishments far from the sea coast should consider this type of problem. All too common throughout the country are locations where ground water supplies are being so rapidly depleted as to offer a serious threat for the near future. Local managements that find their pumping costs increasing as water tables get farther and farther underground may soon find an added difficulty of no available water supply.

There are several remedies, none simple and many costly. Generalization regarding remedy is not safe. But it is both safe and proper to generalize a warning. No part of the United States is free from the threat of loss of adequate pure, cold water supply. Periodic review of local situations with the aid of competent water-supply geologists is certainly an important responsibility of technical plant management.

Canners May Take A Bow

MANY housewives in large cities have individually discovered that canned fruits and vegetables are less expensive than fresh. But it took a nationwide survey to prove that the can opener enables people to eat better for less, on the average, throughout the country. The cost differential with most items is so great as to indicate that canned foods in general also provide the best nutritional values for the money. Then these processed products also are readily available at all seasons of the year. What's more, they are conveniently prepared.

The canning industry is spreading the good word, particularly among home economists and food columnists, who habitually put more emphasis on fresh foods than on canned.

Food technologists and engineers are entitled to take a bow for doing the housewife's cooking cheaper and better than she can do it herself.

Long-Haul Quality Control

IN maintaining product quality, the frozen food packer's problem does not end with the freezing process. Ultimate success in the frozen food business depends on controlling quality during storage, distribution and merchandising. Too often, frozen food processors carefully select top-quality raw materials and process them under exacting procedures set up by the research and quality control departments, only to learn from customer complaints that original product quality was not maintained to the time of purchase.

It is equally important, perhaps more important, that the packer study the changes of product quality in cold storage and establish maximum limits on storage time. Shelf-life can be extended by proper technological studies and better packaging.

Too many manufacturers ship their products with no further thought as to what happens to them during shipping, warehousing and retailing. A product of excellent quality, initially, may arrive in a partially or completely defrosted state. Refreezing, of course, adversely affects product quality in any event and may have dangerous consequences if any degree of spoilage has taken place.

It is the packer's safeguard to devise standards for quality control in distribution and to maintain these standards by frequent inspections.

How To Win An Oscar

IF your company has a new or improved process of which it is proud, the recognition merited by this achievement is worth going after. There is nothing more satisfying than to be cited by your industry or profession as the company which made the most noteworthy contribution to progress. What's more, a reputation for achievement pays off in many ways—among which is pride among your present or future employees in working for a company that is going places.

Such recognition is granted every two years by the Biennial Award for Achievement sponsored by FOOD INDUSTRIES. The next award will be presented in 1949 at the San Francisco meeting of the Institute of Food Technologists. It will go to the food processing company (not individual) whose achievement is rated first by a jury of educators in the field of food technology.

You cannot win this award by hiding your light under a bushel. You must enter your new or improved process in the competition. You can do this anytime now. Send to FOOD INDUSTRIES evidence of a character that will permit the Jury of Award to evaluate the significance of the process.

The best evidence to send is a technical description of the process, accompanied by a flow diagram and photographs. Also explain how the process came to be developed, the steps by which it was developed, and the success—technological or economic—which it has achieved. January 1, 1949, is the absolute deadline for entries. But now is the time to start preparing the evidence.

Complete details on the conditions of the Award were published in the July FOOD INDUSTRIES, page 92. Study these conditions and then decide whether your company has a process which should be entered for the award.

International Problem

FIRST application for relief under the "escape clause" of the Geneva Tariff Agreements came in the food industry. It is significant because it calls for a difficult decision of far-reaching significance and is a portent of things to come. The "escape clause" provides that a tariff concession may be withdrawn or modified if it threatens serious injury to domestic producers. This obviously is a good thing from the viewpoint of the affected industry. Yet too lenient application of the "escape" will impair the function of the Tariff Agreements in improving world trade and the world economic situation. If the world is to have dollars to buy U. S. exports, the volume of imports into this country must increase.

The case in point concerns imports of a "prepared marron," a large chestnut which has been candied, crystallized, glacéd or otherwise processed. In 1936, the duty on this product was cut in half—from 25¢ to 12½¢ a pound. Then along came Geneva and sliced it to 8¢. Shortly thereafter, G. B. Raffetto, Inc., New York, told the U. S. Tariff Commission that the firm's prepared marron business was going to be hurt unless the tariff was boosted.

Raffetto's brief explained that France was the principal supplier of prepared marrons before the war. But now the sweets are pouring in from Switzerland, Italy and even Japan.

For the benefit of other food processors who may be hurt by the Geneva Tariff Agreements, here is the "escape" procedure. Application for relief is filed with the U. S. Tariff Commission in Washington. If the Commission sees merit in the case, it calls public hearings. Then comes a formal investigation and a report to the President, who has the authority to suspend, modify or withdraw a concession.

Byproduct Values Important

EVALUATION of raw materials of diverse type or quality is often an extremely difficult matter. Sometimes the question of relative value of two raw materials hinges on the less evident factors which the inexperienced purchasing agent does not adequately weigh. Recently a case of this sort came up in the field of corn processing.

Certain new hybrid corns are grown extensively because they provide a very high yield in bushels per acre. But recent experience indicates that some of these hybrids are relatively low in both protein and oil content of the kernel. It looks as though nature were willing to give only about the same poundage of protein and oil per acre despite the fact that the total bushel yield very much increased with hybrid corn.

If the corn is used for making of starch and dextrose, the high-starch corn has, of course, an apparent advantage because the yield of the carbohydrates is high. But obviously the yield of byproduct oil and the amount of protein in the feed is correspondingly low. The oil sells for five to ten times as much per pound as starch. The feed is evaluated, or should be, on its protein content. Hence the gross income of the establishment may be cut seriously even though the yield in pounds of major product is increased.

Principal corn-products manufacturers know these facts. But this kind of problem should be studied in respect to other commodities. Merely to gain yield of principal product at the expense of byproduct income is bad business if the *overall* result is less net income. It will be smart to study this kind of thing for every sort of multi-product business.

Mold Growth on Paint

ONE day we saw the preparation department in a big food plant where the paint on the walls and ceiling was a very dirty brown-gray color. It was wholly out of keeping with the purpose of the room, or the rest of the plant, for that matter. It was the worst case of paint failure ever likely to occur in any food processing establishment. For the room had been painted white only five months previously at a cost of about $5,000. It was now covered with mold.

This paint failure had duplicated on a much worse—but larger scale—a failure we once saw in the fermentation room in a bakery where the paint on walls and on dough troughs was speckled with mold spots.

In both cases the wrong type of paint had been used. And in both cases it seems that the paint manufacturer had not been told in advance the condition under which his paint was to be used. Both plants, in disimilar food lines, had departments where high temperature (90-95 deg. F.) and high humidities (90-96 percent RH) existed for about 24 hours a day.

Ordinary paints will not always withstand molding or mildewing under such conditions even though they will give good service under cooler or less humid conditions. For extreme conditions, a paint must be compounded properly or a failure is a possibility.

Ways are known to paint makers to prevent mold growth on paint in severe service. It is not necessary to expand on them here. The point to be driven home is this: Give the paint maker a chance to prescribe the proper paint if your conditions are high temperature combined with high humidity. Sometimes these conditions are produced artificially by process air conditioning, but often they are natural to a region such as the areas along the Gulf of Mexico. It makes no difference whether the conditions are natural or created purposefully, the paint must be adapted to meet the conditions or a failure may occur.

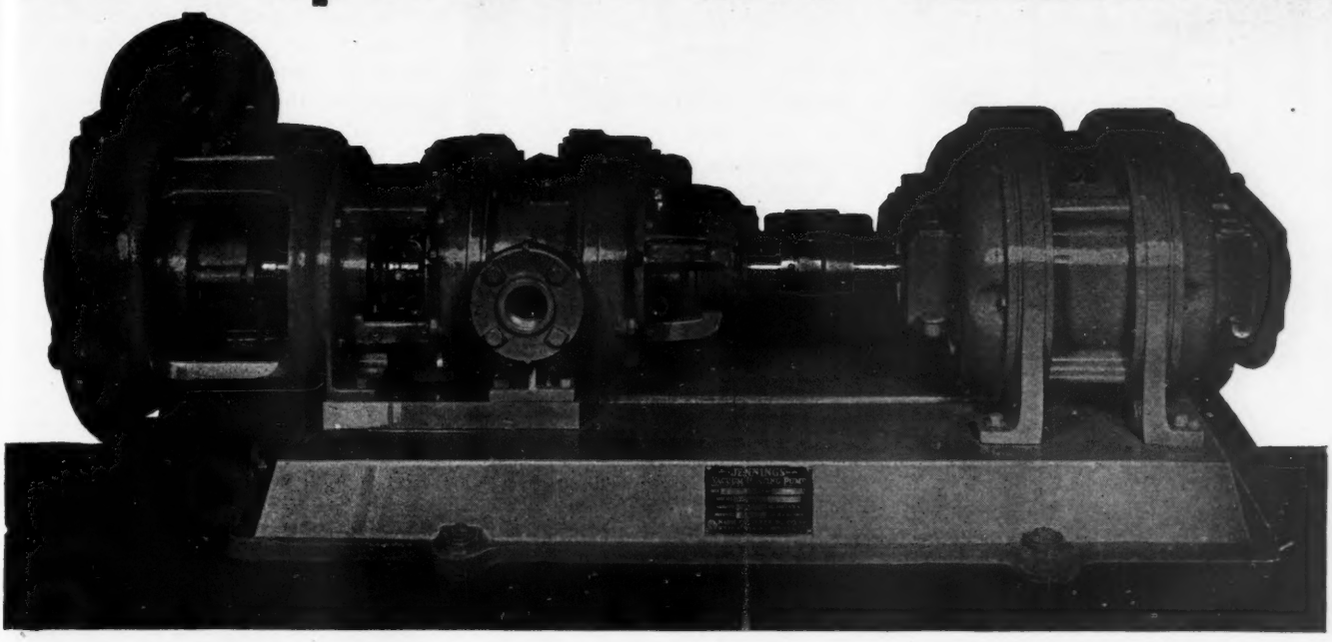
Don't Keep Unusual Conditions Secret

Unless the paint maker knows in advance what unusual condition is to be met, he should not be blamed for a failure. And paint buying is not the sort of job that should be delegated to an uneducated handyman, however faithful he may be. Paint buying for high humidity-high temperature service calls for a much higher degree of technical knowledge than even some purchasing men possess.

If the paint manufacturer knows in advance that the paint must be used under mildewing conditions, he can add a fungus inhibitor during manufacture.

But it should be emphasized that a fungus inhibitor *in* the paint will not do much to stop mold growth in milk solids, flour, cooking fumes and the like that may accumulate *on* the surface of the paint. Proper sanitation will avoid the accumulation of organic matter that will support molds and microbes.

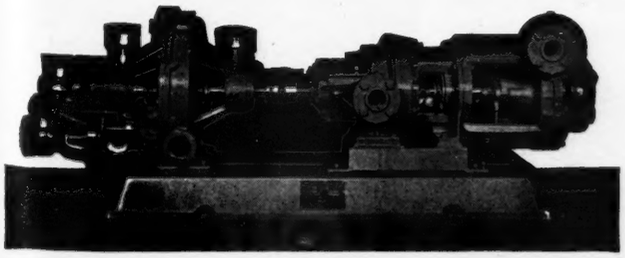
Nash—the Perfected Vacuum Pump for Evaporators and Condensers



COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.



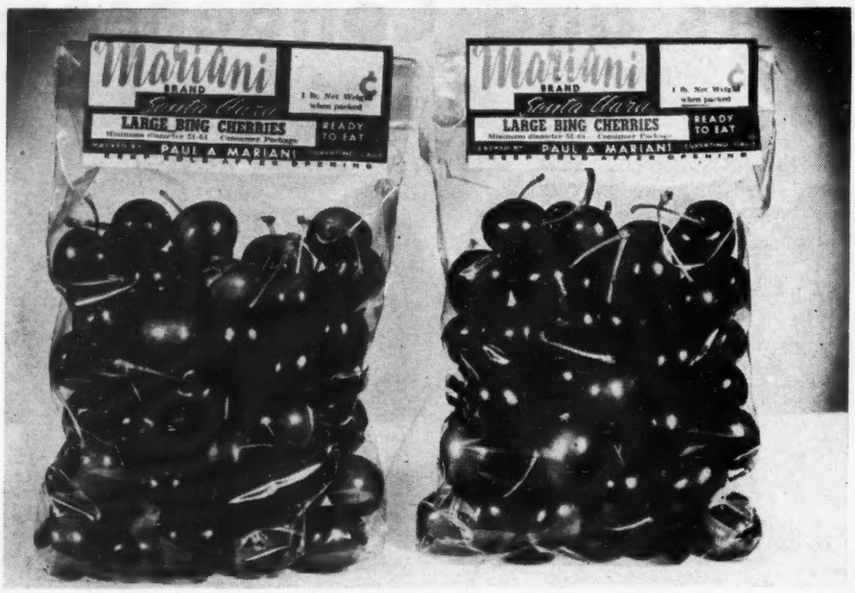
THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.

NASH ENGINEERING COMPANY

SOUTH NORWALK · CONNECTICUT, U. S. A.

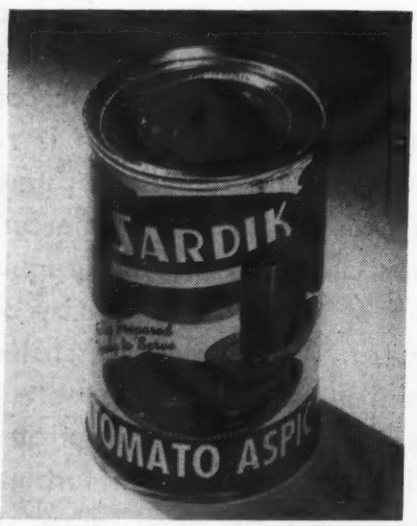
NEW PACKAGES & PRODUCTS



Gas-Permeable Film for Packaging Fresh Fruits

TRANSPARENT cellulose acetate film is finding many new uses in prepackaging of fresh fruits and vegetables. Manufactured by the Celanese Corp. of America under the trade name Celanese Lumarith, the film has the quality of being gas-permeable, permitting "natural breathing" of harvested produce. Oxygen, necessary for ripening, can enter the bag; and carbon dioxide, which the fruit or vegetables give off, can readily escape.

As shown, Mariani brand cherries are now attractively packed in bags of this film, which keep them fresh and flavorsome. And a tent label is effectively used to give the sales story at a glance. Additional advantage of this film is that it undergoes refrigeration without becoming foggy.



Canned Tomato Aspic

FULLY prepared table-ready tomato aspic is now packed in tins by the Sardik Food Products Corp of New York City. Jelled at room temperatures, the product eliminates the pulp straining and boiling chores ordinarily performed by the housewife in making aspic at home.

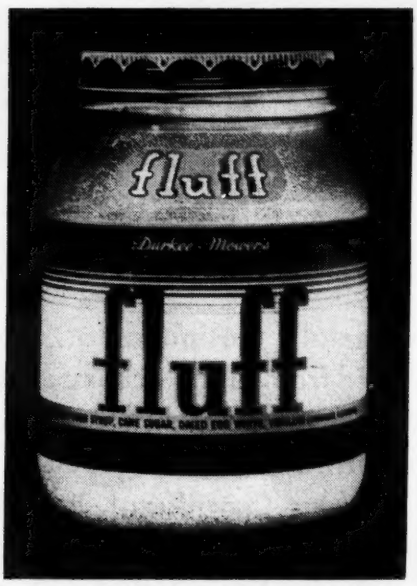
Shrimp-Flavored Chips

FLAKY, PINK CHIPS called Shrimbits are now on the market. Made from a mixture of fresh shrimp blended with potato and tapioca starch, the product is rolled, cut into thin slices, dehydrated, then deep fried in a blend of vegetable oils and gossame. The result is a crisp, crunchy chip which is pink on the outside and white on the inside, resembling the actual shrimp in color as well as flavor.

The food is produced by Susan Baker Products, Inc., and nationwide distribution is planned through authorized organizations. Chips are packed in moisture-proof, Pliofilm-coated glassine bags, attractive metal containers of 2- and 3-oz. capacity, and also 3-lb. institutional size containers.

Housewife's Choice of Jar

SHORT, REFRIGERATOR-TYPE jars with wide top openings are now being used by Durkee-Mower, Inc., Lynn, Mass., to pack Marshmallow Fluff. The jar has been newly redesigned to meet the New England housewife's preference, as determined in a recent market research program.



The survey showed that nine out of ten women wanted a jar enabling easy removal of all the contents and which, when empty, would be convenient for holding leftovers in the refrigerator. Trade and public reception of the new jar is said to be the most enthusiastic in the company's 30 years of business.

Fruit-Juice Mix

BLENDED MIXTURE of Cuban pineapple juice with Florida grapefruit juice has been developed by Bruce's Juices, Inc., Tampa, Fla. Combining sweetness with tartness, the new drink holds promise of popularity. Decision to blend the fruits also was a step toward relieving congestion on the grapefruit market. This season's production of the drink will be limited to the 46-oz. size cans.

Acetate Labels for Fresh-Water-Fish Cans

NEW DISPLAY APPEAL is achieved by the Lakefish Canning Co., Mankato, Minn., by packaging fresh water fish in 6½-oz. cans with special acetate laminated overwrap labels. An unusual motif is employed in silhouetting fish on a background of silver, vermilion, and marine blue, with black for color accent.

The reverse side of the label lists three tested recipes and reminds the housewife that the fish can be used in the same manner as tuna, boned chicken or turkey.

A supplementary top-of-can label, also laminated and printed in red, silver and blue, offers the customer a double-the-money-back guarantee if not satisfied.

National distribution is handled by the Bob White Organization of Chicago. Norbert F. Schwartz designed the label, Jackson Press did the printing, and Arvey Corp. the laminating.

Nut Cake in Tins

CANNED PECAN CAKE is a recent innovation of the Pecan Home Food Shop, Sherman, Tex. The product is manufactured under homelike conditions with high quality ingredients, including flour, sugar, butter, eggs, pure fruit extract, crystallized fruit and pecans.

Vacuum-Sealed Flour Mix

PREPARED WAFFLE AND MUFFIN mix is now packed in vacuum-sealed tin-and-steel cans by Eggo Food Products, Inc., San Jose, Cal. Contents include flour, shortening, sugar, powdered American egg yolks, baking powder

Turn to the EFFICIENT way... Control Insects with

The *efficient* way to keep your mill machinery clean and insect-free at all times is to apply ACRYLON* Spot Fumigant at regular intervals. For ACRYLON is highly toxic to all insects—yet it is so volatile that it leaves no residue to clog machinery or affect food products in any way.

ACRYLON is economical because a little goes a long way. Just a few ounces applied directly to food-processing machines at the points where infestation occurs will give thorough clean-up of insect pests. ACRYLON's fast action gives complete kill with relatively short exposure.

For Thorough Building-Wide Insect and Rodent Control

specify AERO* LIQUID HCN Fumigant. Use it periodically with in-between applications of ACRYLON to strategic spots to assure constant pest control in food plants.

*Reg. U. S. Pat. Off.

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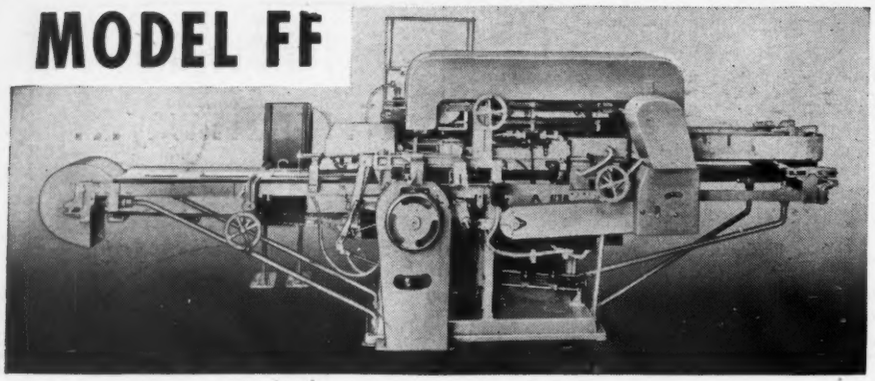
KEEP YOUR PLANT INSECT-FREE AT ALL TIMES WITH LIQUID HCN AND ACRYLON

MODEL FF



Wrapping that stops the shopper —and starts the SALE!

The neat, attractive, tightly-sealed packages turned out by our Model FF inspire shopper confidence . . . stimulate sales. Frozen food men have capitalized on this fact right from the start. And more recently manufacturers of other items such as frankfurters, sausage, butter, margarine, etc., have taken advantage of this economical, sales-building wrapping.

Here are just a few of the reasons why the Model FF has become such an outstanding favorite. Its speed is adjustable—from 40 to 100 packages per minute . . . It features rust-proof parts wherever necessary . . . It is quickly adjustable for a wide range of package sizes, adjustments being made by simple handwheels . . . The elevator well slide is provided with a special oiling system through which soapy water can be forced for cleaning the slide . . . Infeed and discharge belts are supported from the base of the machine, making it easier to move the Model FF from one location to another.

Other Advantages

The Model FF automatically makes allowances for variations of up to 3/8" in the width of packages—products can be wrapped either before or after freezing. Discharge belt measures only 3' in length, making the unit surprisingly compact.

Our nearest office will be glad to supply you with additional information on the Model FF, and to demonstrate how it will wrap products in your line.

PACKAGE MACHINERY COMPANY

Springfield 7, Massachusetts

NEW YORK CHICAGO CLEVELAND ATLANTA
DENVER LOS ANGELES SAN FRANCISCO
SEATTLE TORONTO MEXICO, D.F.

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

and salt. Also suitable for making crisp pancakes and cookies, the vacuum-fresh mix may be sifted and milk added for baking.

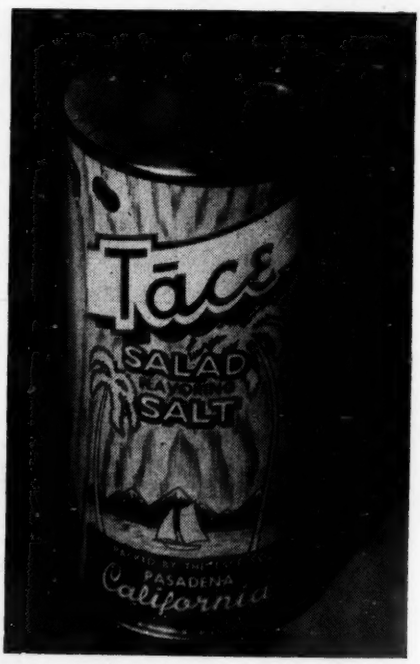
Introduced on a limited scale in 1941, wartime scarcity of tin forced cessation of packing. With production resumed, distribution has begun in the San Francisco, central California and Los Angeles areas. Complete western and, eventually, national distribution is planned.

New Hash in Cans

COOKED BEEF-TONGUE HASH, packed in cans by the E. Greenebaum Co., New York City, is now being marketed under the Wetzstein's brand name. The hash contains approximately 60 percent beef tongue, with the addition of potatoes, beef broth, salt, flavoring and spices.

Salad Flavoring Salt

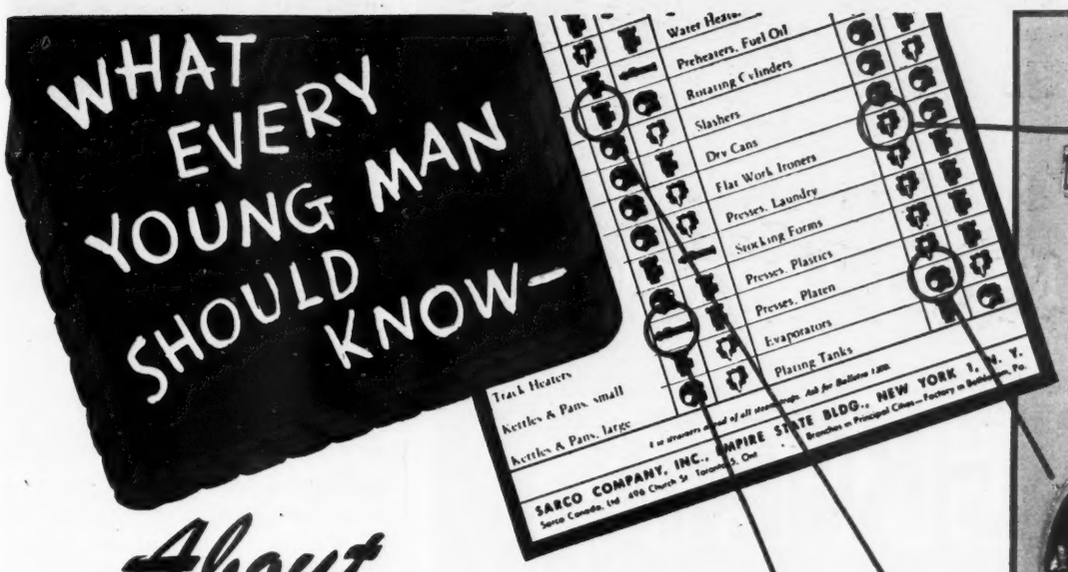
A COMBINATION of sea-salt, dried vegetables, vegetable protein derivative and magnesium carbonate forms the basis of a new flavoring salt, Tace, produced by the Tace Co., Pasadena, Cal. Recommended to enhance or bring out the natural flavor of foods, the product can be used in the same manner as ordinary salt. Packaged in 4 oz. cans, it is being merchandised in Southern California.



Overwrapped Cartons

A NEW series of frozen food packages are being developed for Snow Crop Marketers, Inc. Green pea cartons are the first of the new line introduced.

The package consists of a chip board carton with a Cellophane overwrap



STEAM TRAPPING

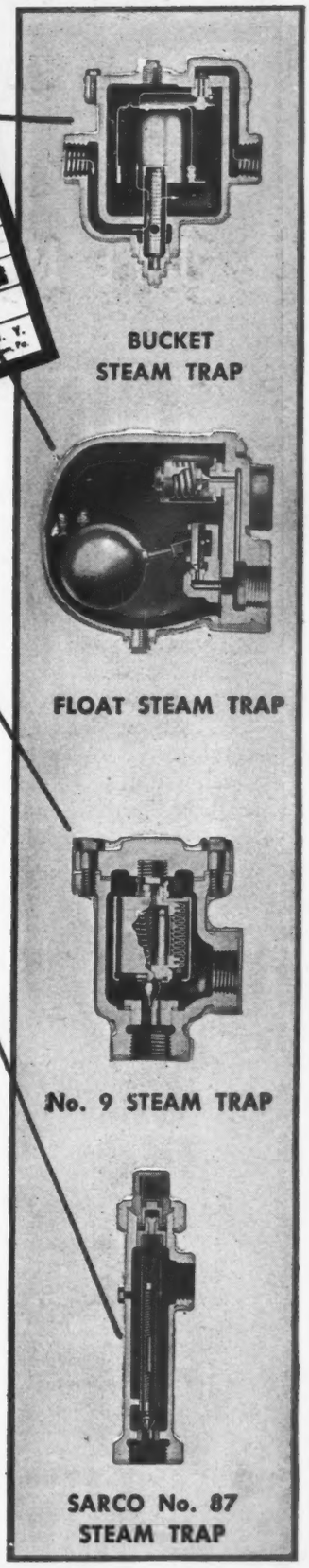
In your industry, you will some day come face to face with the steam trap —a device that lets condensate and air out and keeps the live steam in.

You will need to know that no one type of trap is good for everything and that a separate trap should go on each steam coil. You will learn that several considerations always enter into the selection of the type best suited for a given application. Any one of its special features may be of primary importance to you and should influence your choice.

The experience of years on this subject has been condensed into a four page bulletin with a table showing where each trap is best. Ask for Catalog No. 1600 (on your School or Company letter-head, please).

●

AND FOR THE EXPERT, this Bulletin together with the Sarco Hook-Up Book should be in your files. If you give us an outline of your type of business, a complete set of the Sarco reference data will be sent you as a single book.



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The new PICK-ETS are absolutely uniform, perfect spheres, each having exact maximum melting speed. Easier, cleaner to handle, available in GREEN for cold cans, RED for hot cans—AMBER for normal cans—fit the color to the temperature!

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printed on the reverse side in five color rotogravure by Milprint, Inc., Milwaukee. The illustration shows a reproduction of the product in life-like color.

Other new packages by Snow Crop will be stringless beans and lima beans, both containers to be printed in the same manner.

Ice Cream Containers

NEW LINERLESS gallon and half-gallon ice cream cartons have been added to the line of factory-fill packages offered by the Container Corp. of America. Made of extra heavy paperboard in a special one-piece construction, the cartons stand up square and rigid without distortions during the automatic filling operation. Both sizes are proportioned to fit the standard size cabinets and for storage in combination with each other. Approximately one-third of the space needed for round containers is saved.

FOOD INDUSTRY NEWS

Rewriting of Agricultural Act Promises Sharp Support Battle

With another potato surplus looming, Congress is already apprehensive of public reaction to probable support cost

BUSINESSMEN as well as farmers will be taking sides in the battle over government price supports for farm crops when the long promised overhaul of the Agricultural Act finally gets before Congress.

The issue will be: How high a price floor should the government guarantee for how many commodities?

Fact that Congress passed a two-in-one price support bill during the final minutes of the regular session did not settle the question. It simply established the battleground for the scrap.

The two-in-one now on the books has these parts: (1) A stop-gap, relatively high-support measure—favored by the House farm bloc—that goes into effect Jan. 1, 1949; (2) A "modernized," long-range support law originally passed by the Senate—effective Jan. 1, 1950.

House agricultural experts spoke freely of plans to work over the 1950 price support bill—a reason why they could urge their colleagues to vote for it. But the Senators who got their flexible, long-range law on the books number the following potent allies in their fight to keep the so-called "Aiken Formula":

(1) The professionals at the Department of Agriculture;

(2) The lobbyists for the farm organizations; and

(3) the potato.

The lowly spud is not the least of these. The potato was in the Senate's mind when it took the long view by pushing through a long-range farm bill last session. Senators feared another extension of rigid, 90-percent price supports across-the-board — the ideal which many a Congressman thinks is within reach. The Senators figured such a support program might result in dollar handouts to farmers of such appalling proportions that public revulsion would block any future price support program, good or bad.

In short, the Senators feared another potato fiasco. Burned into the public mind was the widely published picture of price-supported potatoes in mountainous piles being destroyed on the ground less than a year ago. Also etched into the taxpayer's consciousness is the glimmer of the $90,000,000 the government lost in 1946 in supporting the price of potatoes.

The potato object-lesson keeps coming back year after year—and last week's announcement by the Department of Agriculture that $10,000,000 had been spent to support spud prices from this year's early crop was just the beginning.

Food Company Reports Show Sales Stay High

SALES VOLUME continues on the increase, according to financial reports of food companies during recent weeks. For its fiscal year ending April 30, H. J. Heinz Co., reveals total world sales at an all-time high of $169,455,201, an increase of 17 percent over the previous year.

The increase in U. S. sales was 15 percent, while foreign sales were up 26 percent. Net income, however, dropped from $6,104,286 the previous year to $5,033,324, this year.

General Mills, Inc., and Gerber Products Co., on the other hand, surpassed the previous year in both sales and net profit. General Mills reports sales at $458,473,576, an increase of $87,541,149 over the year before. Earnings were $13,068,057, compared with $9,236,214.

Gerber's reported sales of $29,559,180, as against $20,735,179, together with a whopping net of $2,095,668, compared with the previous year's $272,656.

General Foods net sales for the first half of 1948 were right in line, $224,567,000 being reported, as compared with $182,454,000 in the first half of 1947. Net earnings for the period were $13,897,000, as against $8,136,000.

Beatrice Foods Co., showed net sales of $45,938,313 for the first 1948 quarter, compared with $42,615,009 in the like 1947 period. Consolidated net profit was $681,220, compared with $651,589 the year before.

Tator Retires

SAMUEL W. TATOR, director of the dairy branch, Production & Marketing Administration, is retiring from government service, PMA Administrator Ralph S. Trigg recently announced.

Mr. Tator, who has headed the Dairy Branch since April 1946, has been on an extended leave of absence because of ill health. Herbert L. Forest, who has been Acting Director of the Branch during Mr. Tator's absence, will continue in that capacity.

PLAN JANUARY CONVENTION

On Atlantic City's boardwalk, executives of National Canners and Canning Machinery & Supplies Associations chat about convention and exhibit scheduled at Convention Hall, January 15 to 19. From left they are: Carlos Campbell, NCA secretary, and S. G. Gorsline and Eugene A. Hildreth, executive secretary and vice-president, respectively, of machinery and supply group.

Name Food Concerns For Annual Reports

FROM the more than 4,000 corporation annual reports submitted from all over the country for consideration in the Eighth Annual Survey, conducted by Weston Smith of *Financial World,* twelve food products companies have qualified for "Highest Merit Award" citations:

Beech-Nut Packing Co.	Hunt Foods, Inc.
California Packing Corp.	Libby, McNeill & Libby
Consolidated Grocers Corp.	McCormick & Co.
General Foods Corp.	Minnesota Valley Canning Co.
Gerber Products Co.	Pacific American Fisheries
Hawaiian Pineapple Co.	Stokely-Van Camp, Inc.

The 1947 stockholder reports of these companies are candidates for the final judging, and one will be selected as the "Best of the Packaged Foods Industry" and awarded a bronze "Oscar of Industry" trophy.

Separate awards will be given for the following classifications of the food industry: Dairy Products, Meat Packing, Milling, Sugar, Confections, Beverages, Food Containers, etc. The list will be supplied on request.

Scientific Study Planned On Human Food Needs

THE MOST AMBITIOUS scientific study of what the American people eat will be supported by the Sugar Research Foundation during the coming year, Dr. Robert C. Hockett, scientific director, recently announced.

The analysis will be carried out on comprehensive data assembled by the Ellen H. Richards Institute, at Pennsylvania State College, under the supervision of Dr. Pauline Berry Mack. Pennsylvania has been chosen for the study because it is considered to have the most widely representative type of population of any part of the country.

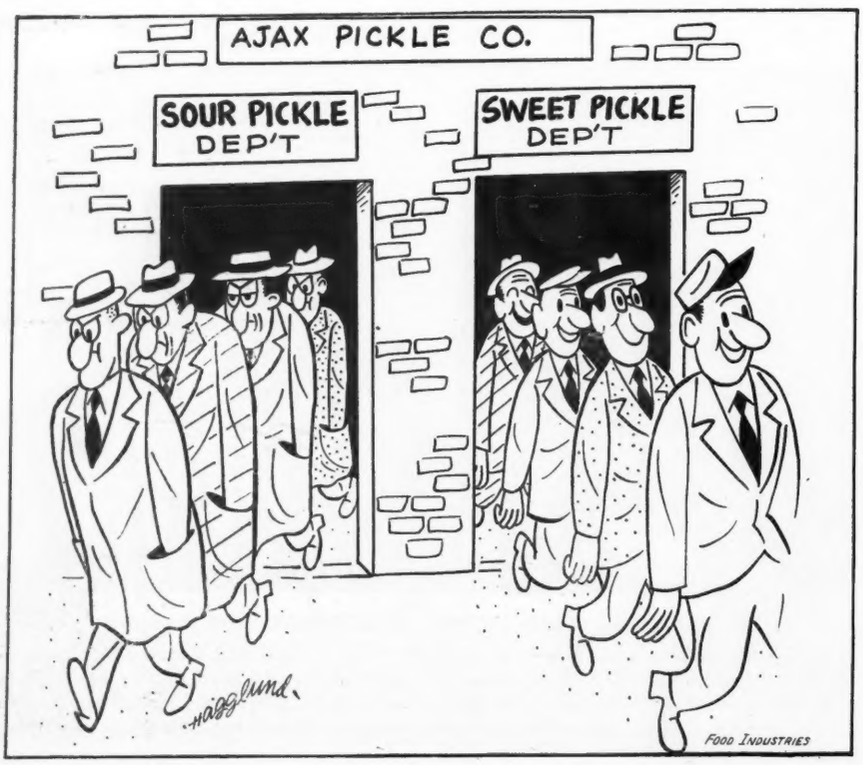
Included in the Pennsylvania data is information on actual food consumption of every person in 450 families averaging 4.2 members. This group embraces 100 urban non-metropolitan families representing incomes ranging from those on relief to $30,000 annually; 100 rural families representing a broad range of income and different types of farm enterprise; 100 village families covering a considerable income and occupation distribution; and 150 metropolitan families covering a wide income and occupation spread.

In addition, the major food types, the caloric content, and the nutrients in the diets of approximately 10,000 individuals from 10,000 different families will be measured.

Cereal Chemists

FOUR SECTIONS of the American Assn. of Cereal Chemists—Lone Star, Nebraska, Kansas City and Pioneer—will meet October 15 and 16 on the campus of Kansas State College, Manhattan, Kan.

Tentative program for the conference includes: Discussion of association affairs, by W. L. Haley, national association president; bread staling, by W. F. Geddes, University of Minnesota; recent advances in carbohydrase chemistry, by Dr. Eric Kneen, Kurth Malting Co.; and development of rancidity, by Dr. Fred Kummerow, Kansas State College.



Government Tightens Equipment Sales Rules

BOTH Department of Justice and Federal Trade Commission are constantly tightening up on merchandising practices. Three recent cases relative to the food industry illustrate the renewed vigor of official supervision:

1. White Cap Co. has accepted a consent decree restricting its use of patent control on closures. Formerly it leased its patented sealing machinery only to purchasers of its own caps. Such tie-in sales and leases are to be discontinued. All this conforms with recent Supreme Court rulings on the case involving salt tablets.

2. Ice cream manufacturers are considering the significance of misrepresentation regarding leasing of machinery to make variegated ice cream. Promotional claims of Joe Lowe Corp. have been subject to complaint of the Federal Trade Commission. It was alleged that this equipment firm was making unwarranted claims as to pioneering in variegated ice cream. This complaint was made despite the official admission that the firm might have valid patentable machinery for which it might make specific technical claims, but not the claim of being first.

3. Dried fruit distribution to "favored buyers" at special price was the subject of another FTC complaint against Bonner Packing Co. Here the issue is the question of proper prices, which the commission says must not favor certain large purchasers by allowing them brokers' rates when they are not brokers.

Food Industry is Cited On Corporate Mergers

THE FEDERAL TRADE COMMISSION has cited the food industry as one of the "most conspicuous" examples of the upward trend of corporate mergers since the war.

In a 260-page report to Congress, titled "The Merger Movement, a Summary Report," FTC has spotlighted what it calls a dangerous trend toward industrial concentration, supplying pertinent statistics.

The food and beverage industry, together with chemicals, and textiles and apparel, have accounted for more than one-third of the total number of corporate acquisitions in the last three years, FTC states.

In its report, the commission says that the expansion of big business by buying up or merging smaller firms has been particularly prominent in such "traditionally small business" industries as foods and wines. Furthermore, the trend has been for big companies to buy out small ones, rather

than a merging of small or medium-sized units.

Horizontal mergers, accounting for 60 percent of 2,000 mergers and acquisitions, which FTC analyzed between 1940 and 1947, were outstanding in the fields of manufacture of such products as canned milk, and in such "local market" operations as dairy products and bread. The latter are frequently referred to as "chain" acquisitions, since their growth has been likened to the spread of chain stores throughout the country.

As examples of recent "backward" vertical acquisitions of basic materials producers, FTC points to the purchase of meat packers, cheese factories, etc., by chain stores.

Other Fields

To illustrate what it calls "conglomerate" acquisitions (ones in which there is no apparent relationship between the companies merged) FTC points out that drug firms have expanded into such fields as baby foods and baking mixes.

Point of the merger report is this: FTC wants Congress to plug a loophole that has existed in the anti-trust laws ever since the passage in 1914 of the Clayton Act, which makes it illegal for one company to merge with another by buying up its capital stock, "where the effect of such acquisition may be to materially lessen competition."

Weak spot is that the Clayton Act says nothing about a corporation acquiring another to reduce competition if it buys up the physical assets of a competing company, thus accomplishing the same end.

It is this loophole—much used in corporate mergers—that FTC would like Congress to plug up. Based on past performance, chances of this legislation are not good. FTC has futilely called on Congress for such action for at least 20 years.

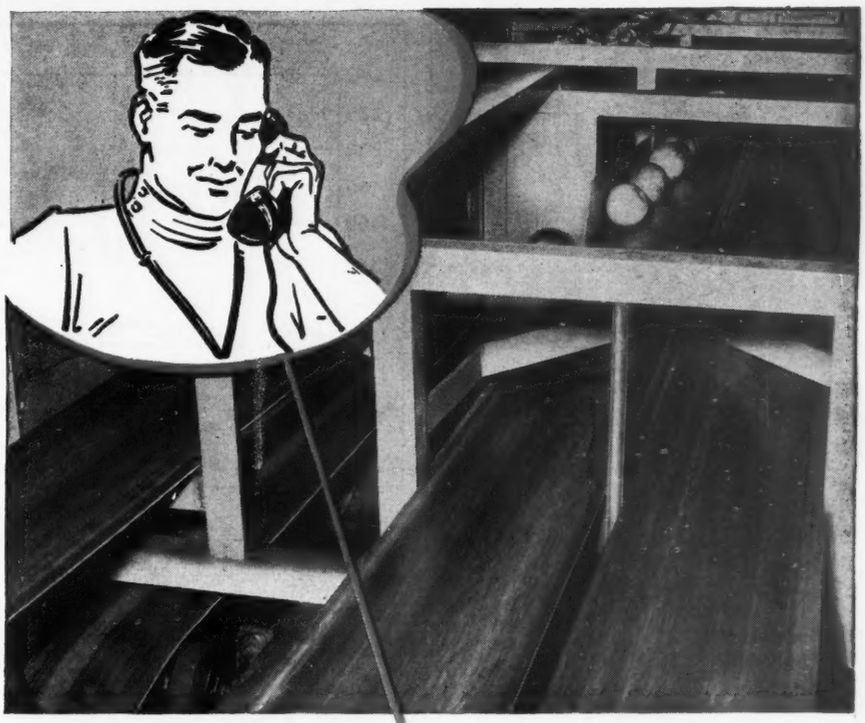
Dry Pea Supports

THE 1948-CROP price support levels for dry edible smooth peas have now been announced by USDA.

Dry edible Alaska, Bluebell, Scotch Green, First and Best, Marrowfat, and White Canada smooth peas—which would grade U. S. No. 1 after normal cleaning—will be supported at $4.80 per 100 lb. of sound whole peas.

On the same basis, the support price for Colorado white peas will be $4.55. Dry peas which would grade U. S. No. 2 after normal cleaning will be supported at 25c less than the peas that would grade U. S. No. 1.

The support prices are based on 90 percent of the July 1 comparable price of $5.25 per 100 lb.



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Power consumption varies with the load and a constant pressure is maintained through the entire capacity range.

Only two bearings—located well outside of the housing—require lubrication.

External bearings assure clean dry air at all times.

Ample clearances permit normal quantities of dust to pass through the machine without harmful effect.

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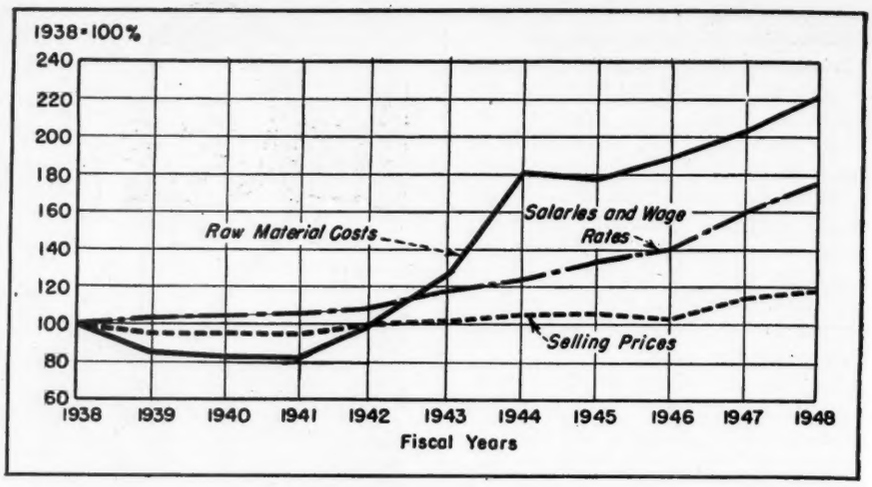

CANNING INDUSTRY STORY

Here is a composite of two charts issued by H. J. Heinz Co. with their annual report. The slight sales price increase in face of mounting costs is typical of the industry.

THE PROCESSING PICTURE

Crush Okra Seed Oil In Louisiana Tests

COOPERATING with Louisiana State University investigators, the Southern Cotton Oil Co. has crushed an experimental batch of 16,000 lb. of okra seed in its cotton seed processing plant at New Roads, La.

Company officials declare that the run was accomplished without any changes in the machinery. The oil yield was 237 lb. per ton of seed.

Most of the seed was produced at the Louisiana State Penitentiary farm at Angola. It was the Louisiana Green Velvet variety, developed by the Louisiana State University Experiment Station. Approximately 150 acres of okra are being grown this year by Louisiana farmers for oil purposes.

Officials of Southern Cotton Oil Co. consider that the price of the oil will approximate that of cottonseed oil.

Tomato Sprays Do Job If Applied All Over Plant

THOROUGH DISTRIBUTION of a fungicide to all parts of the plant, and its being held there for a long time, are the two important factors governing control of tomato diseases in the field, according to scientists at the New York State Agricultural Experiment Station.

Drs. W. T. Schroeder and G. D. Mack, who are working with these problems, say that the poor control of disease by some growers during the past season was caused primarily by insufficient spray or dust coverage of the leaves and fruit toward the center and lower portion of the tomato plant.

In a large scale experiment conducted last year, these specialists compared applications of fungicides, as aircraft dusts and as ground sprays. They found that where the plants were covered completely, instead of just on their tops, the disease control was far superior.

The ground sprayer did a better job of controlling late blight. Tomato yields ranged from 6 tons with the sprayer to 14 tons with the helicopter duster and only 12 tons per acre with the airplane duster.

Shellfish Sanitation Studied at New Lab

THE FIRST MAJOR REVISION in sanitary standards applied to shellfish by state and federal governments may be in prospect—with the establishment at Woods Hole, Mass., of a Public Health Service laboratory for the study of shellfish bacteriology.

The laboratory, located at the Woods Hole Oceanographic Institution, is being financed by a $37,000 appropriation to USPHS, made by Congress for this specific purpose.

First project will be a comparative study of various organisms, such as coliform bacteria, used as indicators of sewage pollution of shellfish and shellfish growing waters.

Following typhoid epidemics caused by oysters, clams and mussels taken from polluted waters in 1925, the Public Health Service recommended certain minimum requirements for shellfish sanitation and prepared a code of recommended practices that serves as the basis for legal regulations adopted by practically all shellfish-producing states.

The new laboratory will re-valuate the technical information upon which these standards are based. The studies

will be carried out, under controlled conditions, on four common varieties of edible shellfish—oysters, soft clams, hard clams, and mussels. Study of the growing waters will be included.

The laboratory will be operated by the Sanitary Engineering Division of the Public Health Service. Several state departments of health also contemplate work in this field during the next year or two in connection with routine control activities.

James L. Dallas, on leave of absence from the Massachusetts Department of Health, will head the new Woods Hole laboratory.

Four Research Centers Tackle Waste Pollution

RESEARCH aimed at reducing industrial-waste pollution of our water resources is underway at four universities and at various other investigation centers around the country, according to the Public Health Service.

The studies, carried on by a number of researchers in sanitary engineering, are made possible by funds obtained through the Division of Research Grants & Fellowships.

This research ties in with an estimated 140 project investigations in the fields of sewage treatment, industrial waste disposal, and stream sanitation, sponsored by industry and the federal government.

Congress has recognized the need for additional research by authorizing in the Water Pollution Control Act an appropriation of $800,000 a year for each of the next five fiscal years. The money is to be used for construction of facilities for research and for the training of pollution-control personnel at the Cincinnati laboratory of the USPHS.

The act also authorizes a $1,000,000 annual appropriation for the next five years to be alloted equitably and paid to the states for conduct of investigations related to the prevention and control of water pollution caused by industrial wastes. Request for an appropriation to carry out the provisions of the new law is to be made at the next session of Congress.

Part of a federal program initiated in 1945, the research aims at improving methods of measurement of water pollution and discovery of means of treatment of sewage and industrial wastes.

Active in the research-grant projects in industrial waste are:

Purdue University (treatment of cyanide and other toxic industrial wastes by ion exchange); Rutgers University, N. J. Agricultural Experimental Station (feasibility of giving secondary treatment to various industrial wastes); Illinois State Water

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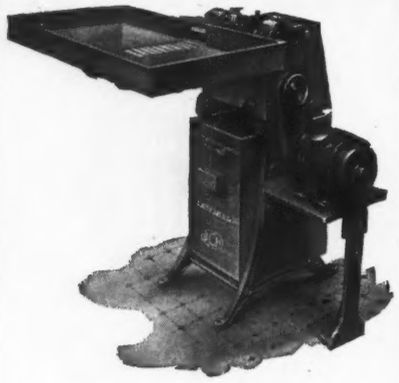

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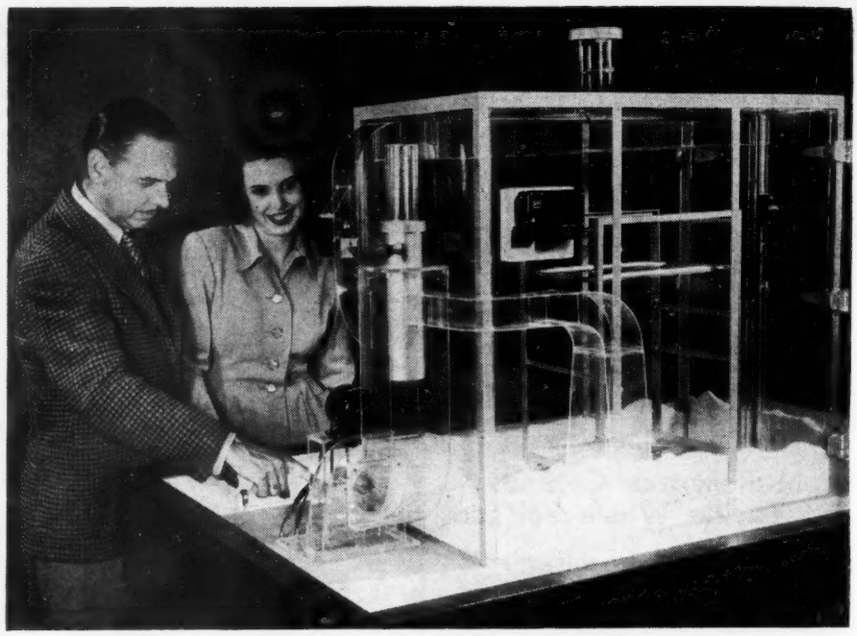


MODEL VIEWS MODEL SMOKEHOUSE

This transparent plastic model of a meat smokehouse will have its first showing at annual meeting of American Meat Institute, in New York City, September 20 to 22. Constructed by industrial designing firm of Barnes & Reinecke, model incorporates all working parts.

Survey (study of infrared and ultraviolet absorption spectra of typical chemical substances in waters containing industrial wastes); and Massachusetts Institute of Technology (study of nutritional requirements involved in biological stabilization of industrial wastes—influence of loading and temperature, solids concentration in aeration process).

Besides these, USPHS lists about a dozen other projects primarily concerned with sewage treatment problems.

AIB Sanitation Course Is Scheduled in Boston

AMERICAN INSTITUTE OF BAKING, Chicago, will hold a new type regional sanitation course, beginning September 13, and continuing for 4½ days at Hotel Sheraton, Boston.

Designed especially for bakers and allied tradesmen in the New England area, this may be the only sanitation course held by the Institute within the next 18 months in the eastern states.

William Walmsley, principal of the AIB School of Baking, will be among the four or five speakers participating in the course. His lectures will include: "Organization of the Baking Plant to Achieve Better Sanitation"; "Fundamental Problems of Sanitation as Seen Through a Baker's Eyes"; "Rodent Proofing of Bakeries"; "Special Technics Required for Fumigating Boxcars"; "Spot Fumigation of Flour Handling Equipment"; and "Fumigating Stocks of Ingredients Under Tarpaulins in the Bakery".

The Institute also reveals that plans are under consideration for expanding the scope of the in-plant training bakery sanitation program inaugurated in March 1948.

Since the program was started, it has developed so rapidly that a broadening has become necessary to accommodate the number of bakers who wish to participate. If suitable personnel can be added to the sanitation department staff, the program will be doubled in its scope.

The in-plant training program includes a detailed inspection of participating bakeries, followed by recommendations that enable management to undertake improvement measures in a practical way at minimum cost.

Produce Potato Flour For Bizone Shipments

PUTTING idle factory equipment to work making flour for Europe from surplus potatoes is one of the latest moves in the Department of Agriculture's continuing attack on farm problems at home and food shortages abroad. This new development, using machinery at distilleries and food-processing plants, has already multiplied tenfold the country's output of potato flour.

The U. S. normally produces about 15,000,000 lb. of potato flour a year. But current demand, developed largely through the department's efforts, greatly exceeds this amount. The Commodity Credit Corporation has recently announced an offer to buy up to 488,000,000 lb. for relief feeding in Bizone Germany alone. Potato bread has been "the staff of life" in central

Europe for centuries, and potato flour is welcomed as a supplement to grain flour in European diets.

Part of the needed increase in potato-flour production has been made possible through work by engineers at the Eastern Regional Research Laboratory of the Bureau of Agricultural & Industrial Chemistry. They have helped food-processing plants and distilleries to convert idle equipment, such as washers, cookers, and drum driers, to flour manufacture.

Milton Parker Heads IFT-Army Committee

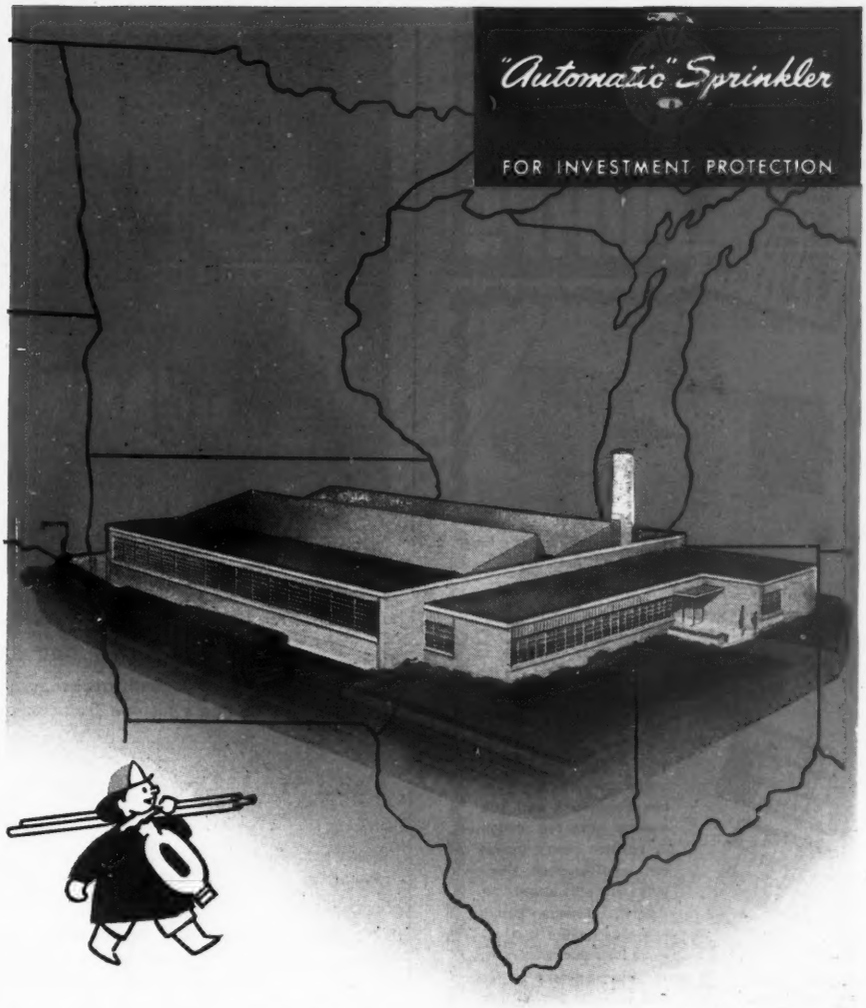
APPOINTMENT is announced of Milton E. Parker, professor in charge of the food technology program at Illinois Institute of Technology, as chairman of the committee to serve as liaison between the Institute of Food Technologists and the Department of the Army.

The committee was announced by H. C. Diehl, president of the Institute of Food Technologists. It was established primarily to provide advice and assistance to the Department of the Army in matters pertaining to food technology.

Other members of the liaison committee are: M. L. Anson, director of research, Continental Foods, Inc.; Fred C. Blanck, H. J. Heinz Fellow, Mellon Institute; B. S. Clark, director of research, American Can Co.; William Geddes, University of Minnesota; Emil Mrak, University of California; John Nair, assistant director of research, Continental Foods, Inc.; and George F. Stewart, Iowa State.

HEADS FOOD TECH SCHOOL

Louis B. Howard has been named to head the recently formed department of food technology, in the College of Agriculture, University of Illinois. Dr. Howard received his Ph.D. at the University of Chicago in 1930, joining the bureau of agricultural and industrial research, USDA, in that year. He became chief of the bureau in 1946, from which post he resigns to assume his new duties.



To better serve the Fire Protection needs of the great Mid-West with "Automatic" Sprinklers

HERE'S important news for owners of industrial and commercial properties in and around the great Middle West. *"Automatic" Sprinkler*, pursuing its policy of continued expansion, has recently opened a new Chicago plant, pictured above, where facilities now enable us to offer fire protection engineering, construction and maintenance service on a vastly improved basis. And, this is but one of several new plants of this type that are being located in strategic areas throughout the Western Hemisphere, thereby making it possible for you to obtain the recognized advantages of *"Automatic" Sprinkler* fire protection, *an important investment today . . . perhaps welcomed protection tomorrow.*

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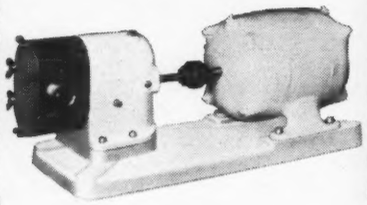
FIRST IN FIRE PROTECTION
DEVELOPMENT · ENGINEERING MANUFACTURE · INSTALLATION
"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO
OFFICES IN PRINCIPAL CITIES OF NORTH and SOUTH AMERICA

WATEROUS SANITARY PUMPS

STAINLESS STEEL 100% SANITARY



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POSITIVE ROTARY ACTION

ONE PIECE ROTOR AND SHAFT ASSEMBLY

SLOW SPEED ELIMINATES AGITATION

NO THREADS, SPLINES OR KEYWAYS IN PUMPING CHAMBERS

SANITARY MECHANICAL SEALS

NO BEARING SURFACES IN PUMPING CHAMBERS

REVERSIBLE INTAKE DISCHARGE PORTS

Ball bearing construction throughout, here is a modern advanced design in positive rotary pumps for handling food products of all kinds. A simple, efficient design and construction that assures long efficient service, the heavy duty precision ball bearings control both radial and end thrust loads on shafts and rotors. Bearings and timing gears operate in oil to assure long life and quiet operation . . . no internal metal friction in the pumping chamber.

There are no internal shaft or seal threads to contaminate your product. All liquid contact parts are removable for easy cleaning. Its slow pump speed eliminates agitation or aeration of product being pumped . . . capacity is in direct proportion to the pump speed . . . Waterous Sanitary Pumps can be operated at speeds ranging from 50 to 600 r.p.m.

Check the features emphasized and you'll see why food product plants prefer Waterous Sanitary Pumps for high quality, sanitary construction and efficient service backed by 62 years of continuous pump manufacturing.

Write for complete information to:
WATEROUS COMPANY
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DESIGNED AND MANUFACTURED BY EXPERIENCED Engineers

Waterous Dependable SINCE 1886

Wide World

SUGAR CANE ON ITS WAY

Part of Puerto Rico's second largest sugar crop is shown here on its way to grinding mill. Two-thirds of island's income from exports comes from its 300,000 acres of sugar cane.

Food and Drug Amends Standards on Foods

RECENT DEVELOPMENTS concerning Food & Drug Administration standards:

Canned green and wax beans and bromated flours were covered in final orders amending existing F&DA standards. These orders appeared during July as expected, the former on page 3724 of the July 3 *Federal Register* and the latter on page 4231 of the July 23 issue. There were no changes from the tentative orders (previously reported by FOOD INDUSTRIES).

Frozen fruits hearing adjourned July 16 after two days of resumed testimony on saccharine as an optional sweetener. October 1 was set as the date by which briefs must be submitted. A tentative order will probably not be issued for some weeks thereafter.

Canned oysters testimony was taken for three days in early July, in compliance with the 9th Circuit Court of Appeals order in June. Willapoint Oysters, Inc., gave more details on its method of blanching before canning. Official findings by F&DA were expected in early August.

Cheese and salad dressings tentative orders on standards of identity were still awaited as this issue went to press.

Soft cheese standards amendment (cream, neufchatel, and cottage types) was under discussion in early August. Use of concentrated or dried milk products was requested by a substantial portion of the industry. The hearing was announced on page 3749 of the July 3 *Federal Register*.

Flour, and later bread, standards are probably going to be discussed during the Fall. An industry request has been anticipated to add chlorine dioxide and delete nitrogen trichloride as permissible optional flour bleaching and aging ingredients. Following that hearing, it is likely that F&DA will reopen the bread record for additional data. No final standards were ever promulgated after the 1941 hearings and the 1943 tentative order.

USDA Grade Standards

APPROXIMATELY a dozen actions in July marked one of the busiest months in Production & Marketing Administration grade standard work. In most cases amendments of existing standards were involved.

Canned citrus juices, including grapefruit, orange, tangerine, and blended grapefruit and orange, were in the *Federal Register* for July 21 and 22. Minor changes were made in the maximum and minimum acid requirements of the canned juices, incorporating sweetness-to-acid ratios in the orange, tangerine, and blended juices for the first time.

Maximum ratios of sweetness to acid were set for the "U. S. Grade A" or "U. S. Fancy" juices. Increased ratios of sweetness to acid were proposed for grapefruit juice. In the blended grapefruit and orange juice, a minimum of 50 percent orange juice was proposed, unless the orange juice was from light colored fruit, in which case 75 percent was proposed as the minimum. Comments on these proposed standards were to be filed within 30 days of printing in the *Federal Register*.

Canned green and wax beans have

been covered by grade standards for some time. A revision was proposed in the *Federal Register* of July 9 to bring them into agreement with certain changes in the Food & Drug standards of identity and quality, requested by the industry and granted in July.

Frozen raspberry grade standards have been formally revised, effective August 16, by an order appearing in the July 15 *Federal Register,* beginning on page 4004. Negligible change from the proposed order (reported on page 138 of July FOOD INDUSTRIES) appeared in the final order.

Cucumber pickles grades were promulgated on page 4222 of the July 23 *Federal Register,* to become effective on August 22. Only four styles were named, consolidating into one style the "cross cut" and "slices," which were originally proposed (page 142, June FOOD INDUSTRIES). Six types were given, as before, and three grades were specified: "U. S. Grade A" or "U. S. Fancy", "U. S. Grade C" or "U. S. Standard", and "U. S. Grade D" or "Substandard".

Fill of container and minimum drained weight, though not factors of quality for the purpose of these grades, were recommended. The usual numerical system of rating, detailed methods of ascertaining the grade, and a sample score sheet were included.

Tomatoes, field-grown fresh, were considered under newly proposed consumer standards appearing on page 4235 of the July 23 *Federal Register.* Three grades, four sizes, and four classes of maturity were included. Comments were to be accepted until August 12.

Shell eggs in the consumer grades were formally promulgated in the July 20 *Federal Register,* page 4117. There were no changes from the proposed standards (reported on page 138 of July FOOD INDUSTRIES).

Sweet potato standards were also formally promulgated, to be effective

CORRECTION

In reporting the second annual production conference of the Pennsylvania Manufacturing Confectioners' Association, on page 139 of the July Food Industries, the wording of the abstract of James A. King's discussion permitted an erroneous interpretation. It should have read as follows:

When invertase is added to fondant cream centers, the invertase changes part of the sugar into invert sugar thereby increasing the density of the sirup portion of the fondant. As a result the fondant cream centers are less liable to dry and ferment. Invertase also acts to soften the cream centers.

. . . there's an easier way

there's also an easier way to clean your equipment!

JUST let built-for-the-job Oakite cleaners do the muscle work. All you do is apply the cleaner as directed; then flush away loosened residues. Easy as that!

Oakite alkaline-type cleaners emulsify the fats, wet and penetrate vegetable and fruit residues. Acid-type cleaners dissolve lime-scale . . . remove rust and stains. These soils are suspended in the cleaning solution for easy rinse-away. Here's a look at the way many food processors handle cleaning chores with carefully compounded Oakite cleaners . . .

CLEANING POTATO CHIP MACHINES Apply solution of Oakite Composition No. 24 to kettle bottoms and upper sections with the Oakite Hot-Spray Unit (data in FREE Manual F7273—clip coupon). Rinse, then repeat. Unit gives even flow of cleaning solution. Alkaline-type Oakite cleaner easily loosens even tough carbon-based deposits. Equipment comes out 100% clean. Now look at this cleaning job . . .

CLEANING STAINLESS STEEL SOUP KETTLES Wet down inside of kettle with solution of Oakite Compound No. 36. Allow short soak, then drain cleaning solution to next kettle and so on through battery of kettles (send coupon below for more details). Cleaner easily removes stains and cooked-on soils that ordinary cleaners don't touch. One food packer shows a 40-minute saving per kettle. Now for . . .

CLEANING WIRE MESH BELTS Spray belts with solution of Oakite Composition No. 24 through Oakite Steam Gun. Detergency, heat and pressure give thorough cleaning action. Speedily remove tomato, carrot, potato and other residual deposits—without harming metal. Give belts long efficient life (facts in "Oakite 97 Digest"—send coupon).

MAYBE YOU have a cleaning, descaling or paintstripping job . . . maybe it's a problem in chemical sterilization or rust-proofing: Oakite makes the materials to handle all those jobs efficiently at less cost. For helpful, FREE cleaning data . . .

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At no cost to me, please
Tell me how to clean this equipment, ...
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Technical Service Representatives in Principal Cities of U. S. & Canada

Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

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A NEW IDEA

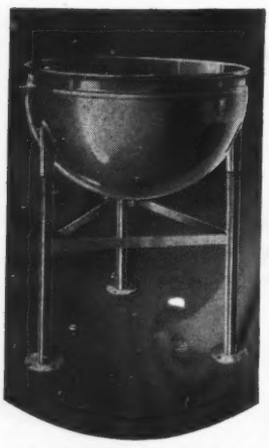
SANITARY SLEEVE VALVE

FOR ALL KETTLES MADE BY

HUBBERT

AN IMPROVED METHOD

of processing which keeps outlet tube free of all material thus eliminating repouring and assuring perfectly mixed batches of contents. A great saving in labor cost is effected and the continual watching of kettle is unnecessary.



SIZES 2-2½-3" OUTLET FITS ALL JACKET KETTLES & TANKS AND CAN BE USED ONLY WITH NEW KETTLES

Made of cold drawn stainless steel, highly polished, this valve is in accord with Hubbert quality and is designed for long wear and accurate operation. Valve openings lies close to the bottom of inner shell. Will shear off heavy and semi solids and large particles.

P. H. HUBBERT AND SON INC.
STAINLESS STEEL FABRICATORS

Makers of the world's finest seamless drawn stainless steel steam jacketed kettles

1300 Block S. Ponca St.,
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on August 1. These grade standards appeared on page 3689 of the July 2 *Federal Register*. There were no changes from the proposals.

Citrus fruits amended standards were also proposed. U. S. combination grades are eliminated as applied to Florida fruits. All U. S. grades of Florida oranges would be required to meet internal quality specifications of "U. S. Grade A" juice.

Some changes on shape and color requirements are also proposed for oranges. Grapefruit shape and texture requirements on U. S. No. 2 Grade are raised. Discoloration requirements in U. S. No. 1 Grade are less strict. U. S. No. 3 Grade is eliminated. New color requirements are proposed for U. S. No. 1 and U. S. No. 2 tangerine standards. In all cases comments on these proposals were due by early August.

Peanut grade standards (cleaned Virginia type, in the shell) have been liberalized to allow more minor cracks and breaks in the hulls. U. S. Extra Hand Picked grade is deleted.

Candy Technologists

Local organization meetings of the American Assn. of Candy Technologists are planned for Chicago, Boston and New York City during the early part of September, according to association Secretary Hans F. Dresel, 15 Lombard St., Philadelphia.

Plans are being made to have a prominent candy technologist address these initial meetings, which will comprise either a luncheon or dinner gathering, depending upon the preference indicated by the members. The secretary is also awaiting member suggestions before assigning specific dates.

Baking Scholarships Awarded at Oklahoma

Two scholarships in baking have recently been accepted by Oklahoma A.&M., for its school of technical training. To be known as the "Charles Dennery Memorial Scholarships," these annual awards are made possible through Maurice Dennery, of Charles Dennery, Inc., New Orleans, in memory of his brother.

These scholarships help to emphasize the growth and development that has taken place in Oklahoma A.&M.'s school of baking since the close of the war. Planned at first as a veteran's course, the college now offers the curriculum for civilian students seeking preparation for entrance into the baking industry.

DEVELOPMENTS IN DISTRIBUTION

Packaging Institute Plans Lively Forum

Wasted packaging dollars and how to avoid them will be the subject explored at the tenth annual forum of the Packaging Institute, scheduled at the Hotel Commodore, New York City, October 14 and 15.

Program Chairman A. F. Stevenson, Borden Co., in outlining plans for the two-day meeting, emphasized the many sources of these wastes, including improper organization, inadequate liaison, and the absence of such functions as field tests, control, responsibility, machine care and preventive maintenance. These and other waste causes will be discussed by members of the Institute.

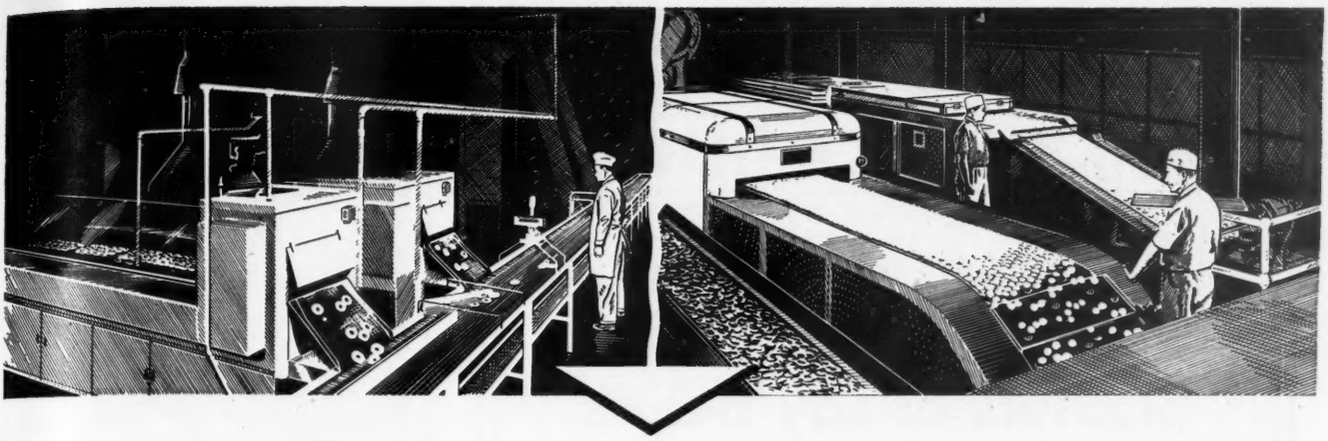
In addition to the main theme, seminars are being arranged on such lively questions as: Is it a better package or better sanitation that is needed for the maintenance of frozen foods?; care of the sticky end of the machine; selecting the right kind of adhesive for the problem and the machine; analysis of the responsibilities of suppliers and users; and how far is a company justified in further package improvement.

Other subjects already selected for discussion concern: The packaging engineer and where he fits in the organization, statistical control of net weight, and how packaging affects distribution costs. A representative of the warehouse industry is scheduled to tell how proper packages can save or increase these distribution costs.

Processing and Sales Join at GMA Meeting

Closer cooperation between the food manufacturer and the distributor was advocated at the mid-year meeting of the Grocery Manufacturers of America, at White Sulphur Springs, W. Va., early in July. Both will have to face curtailed margins in the closing half of this year, they were told by Paul S. Willis, GMA president, despite the outlook for maintenance of a high dollar volume for national brand products.

Distributors, Mr. Willis said, are smarter merchandisers today. They are relying, to an ever increasing degree, upon those manufacturers who promote best and who show them how to do the same with their own individual interests. The job to be done, he said, includes the continued development of new and improved products, free channels of distribution for all



MODERN GAS EQUIPMENT FOR YOUR Streamlined BAKERY

Streamlining is just one of the steps you can take to protect profit margins. But you can make that a big step when you install modern Gas Equipment for economy, flexibility, and cleanliness.

Whether you're baking cookies, crackers, bread, pastries, there's always the need for precise oven temperatures, and automatic heat control over the widest possible range—features you'll find in every installation of GAS and modern Gas Equipment.

In thousands of bakeries automatically controlled Gas Ovens guard the taste appeal and marketability of fancy specialties and staple foods, supplement the skill of the master baker. You, too, can take advantage of profit margin protection with GAS because modern Gas Ovens are designed for streamlined production in bakeries of any size or type.

Here's An Easy Way To Check Up On Bakery Streamlining—Just Fill Out And Mail This Coupon.

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Please arrange to supply me with information on modern Gas Equipment. We specialize in baking_____

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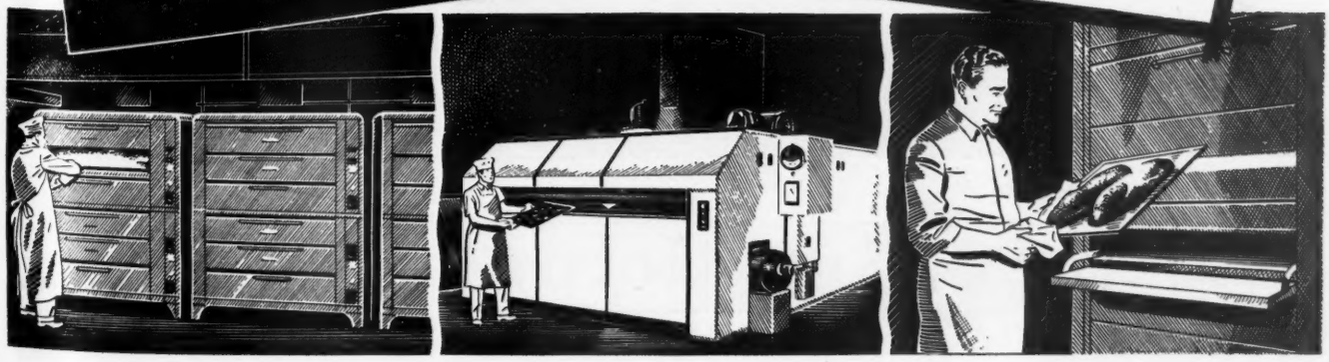
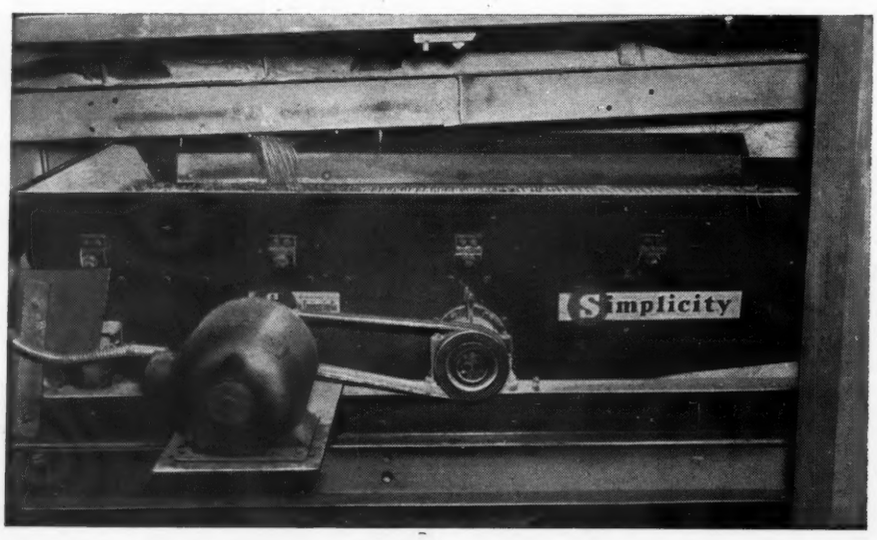
MORE AND MORE... THE TREND IS TO GAS FOR ALL COMMERCIAL BAKING



SIMPLICITY UNIT SCREENS 2600 bushels of soy beans per hour

What's your food processing problem? If it concerns sizing and separating, Simplicity Gyrating Screens will solve it . . . quickly and profitably. Consider the top-notch job a Simplicity 3' x 6' Single Deck Screen is doing for an Ohio Farm Bureau Co-Operative Association in screening stones from soy beans. Previous to the installation of the Simplicity screen, a set of hard roll shells and press screws gave only about five months' service. Now, however, the soft shell rolls and press screws being used show little sign of wear and will have an estimated life-span of 24 months. Equipped with 3/8" square opening screen cloth this unit is operating 24 hours a day and screens 2,400 to 2,600 bushels of beans every hour and can easily handle more if production demands. We'll be glad to review your food processing problems and suggest Simplicity equipment that will increase production and save you money. Just send us the information.



For Canada:
Canadian Bridge
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Simplicity
TRADE MARK REGISTERED
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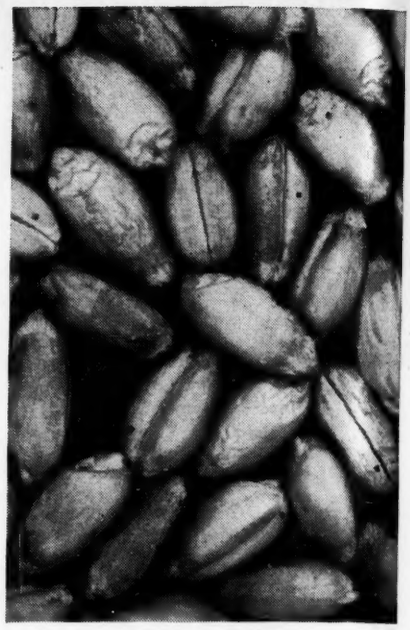

GRAIN INFESTATION

USDA entomologists have developed a test for detecting weevil infestation in grain. This sample has been soaked in a solution of acid fuchsin, then washed. Little red dots showing on grain mean unhatched eggs are in kernel, and proper fumigation to curb damage in storage is indicated.

goods, an overall cooperation campaign to keep the American people food minded, and provision of nutritious food at lowest prices.

Voicing another strong plea for close cooperation, Forrest Fraser, Kroger Co., pointed out that the interests of the supplier and retailer are identical. The supplier provides the mass product, the retailer offers mass distribution. It is a volume business, Mr. Fraser declared, and it is wasted effort to put selling punch on products that will not naturally generate a large volume.

He cited present conditions in which canned peaches are a natural volume item—whereas canned pears are not. Kroger stocks canned pears for those who want them, but they promote canned peaches because the peaches will repay the attention given them.

His company, Mr. Fraser continued, determines by analysis a "basic assortment" of each item and commodity group. Selling effort is then centered on key items or brands chosen from this group. This selectivity, he warned, is an important point for manufacturers to keep in mind. Even though his company is making a special effort with national brands, the leading brand is selected on its sales performance record, regardless of whether it carries a national, local or private label.

In carrying out consumer promotion operations, manufacturers were urged by J. O. Peckman, A. C. Nielsen Co.,

to balance carefully the cost against the share of consumer sales obtained, in order to select the types of promotion that work best for the individual manufacturer. While Mr. Peckman refrained from making sweeping generalizations, he offered the following personal observations on promotion:

1. Don't promote a product unless it is really good. 2. Consumer promotions rarely stop a declining sales curve. 3. Sales gains on old, well established items, occuring as a result of consumer promotion, are usually temporary. 4. Some of the sales gain obtained on a new product as a result of consumer promotion are frequently fairly long lasting, if the product is top quality at the price. 5. Frequent, successive promotion on the same product generally produces smaller and smaller sales results.

Ask Soybean Producers To Invest in Promotion

U. S. SOYBEAN PRODUCERS are being asked to invest ⅓c. per bushel from the returns of their 1948 soybean crop in a nationwide educational-promotional-legislative program, Geo. M. Strayer, secretary of the American Soybean Assn., has announced.

Stimulated by wartime demands, the soybean crop has grown in acreage faster than any other commerical farm crop in history, and a nationally integrated program in behalf of the soybean industry is now very much needed, according to Strayer.

The program for the ASA, which is on a purely voluntary basis, was launched by Paul C. Hughes, association field representative, in selected Ohio and Illinois communities in June and July. Collections from producers of the 1948 soybean crop will be through local elevators.

The plan, said Strayer, will follow the same general pattern used by the National Cotton Council, the Citrus Fruit Growers, National Livestock & Meat Board, and other organizations that actively promote farm crops.

Processors Watching FTC on Base Pricing

MANY food processors who never did so before are now keeping a sharp eye on the Federal Trade Commission. Reason: They're looking for a tipoff as to how hard FTC will swing the Cement Institute decision against delivered pricing in other industries, like food.

One such tipoff came to light recently in an FTC case against National Lead Co. and a half dozen other producers of white lead and various pigments for paint manufacture.

In its brief on a trial examiner's

A NEW HIGH
... IN BRONZE GATE VALVE DESIGN

LUNKENHEIMER
200 LB. BRONZE *UNION BONNET* GATE VALVE

The new Lunkenheimer 200 Lb. Bronze Union Bonnet Gate Valve incorporates the first application of full cylindrical body sections in bronze gate valves. This construction, previously used only in higher pressure steel valves, provides great strength and maximum resistance against distortion of the valve body and seats due to internal pressure strains and other stresses. Tests made under the most severe conditions prove that this design will not distort and will maintain initial proportions and seat tightness.

In addition to the cylindrical body construction and other service-giving features, these valves employ Lunkenheimer's patented Alloy Stems which eliminate stem thread failure due to wear.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI 14, OHIO, U. S. A.
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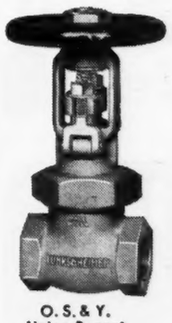
Fig. 2228—Screw Ends
Fig. 2229—Flange Ends
Double Disc
Rising Stem

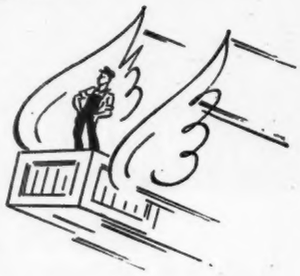


O. S. & Y.
Union Bonnet
¾ to 2 inches
Fig. 2232 — Screw Ends
Fig. 2233 — Flange Ends
Wedge Disc, Rising Stem

Union Bonnet
¼ to 2 inches
Fig. 2230 — Screw Ends
Fig. 2231 — Flange Ends
Wedge Disc, Non-rising Stem

Complete information is given in Circular No. 534. Ask your Lunkenheimer Distributor for a copy or write us direct.

Engineered to move materials with **SPEED SAFETY EFFICIENCY**



CM HAND AND ELECTRIC HOISTS

CM overhead materials handling units are designed to increase plant output and lower production costs by mechanizing and speeding the movement of materials. If you are improving or expanding your plant, it will pay you to check up on CM industrial hoists. Three of the most popular units in the CM line are...

The CYCLONE Model M High speed heavy duty hand hoist. 96% efficient. 1 ton capacity weighs only 35 pounds. Sealed in lifetime lubrication. Capacities from ¼ ton up.

The COMET Portable, speedy, sturdy electric hoist. One-hand control. For plug in on 110, 220 or 440 volts. Capacities from ⅛ to 1 ton.

The METEOR Fast, heavy duty electric hoist. Airplane type cooling. Push button control. Single or two speed. Capacities from ½ ton up.

Write today for literature and the name of your local distributor who handles the complete line of CM overhead materials handling equipment.

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(Affiliated with Columbus McKinnon Chain Corporation)

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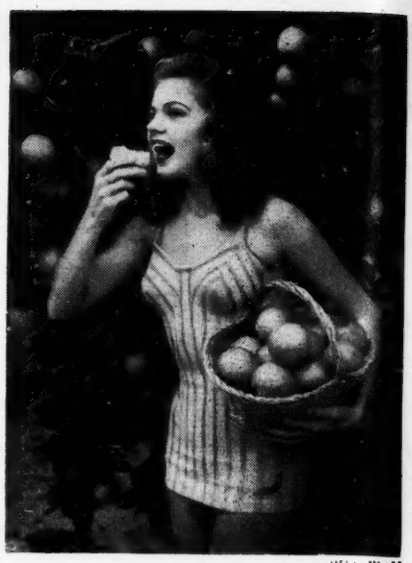


Wide World

BASKET OF ORANGES

Well, sir, the caption says Bobbie McIntyre likes Florida oranges and they like her—which seems like a lot of trouble to go to for the sake of the few readers who will bother to look at the caption.

recommended decision, FTC trial lawyers reiterated the idea that delivered pricing is illegal only if the commodity is:

(1) Standarized with little quality difference between the product of one seller and another, and (2) so heavy that freight charges are an important part of the final cost of the product to the buyer.

Another point in the case involved the trial examiner's finding that, in this industry, there was no price discrimination against near-the-mill buyers when a producer charged one delivered price to all customers within a single zone.

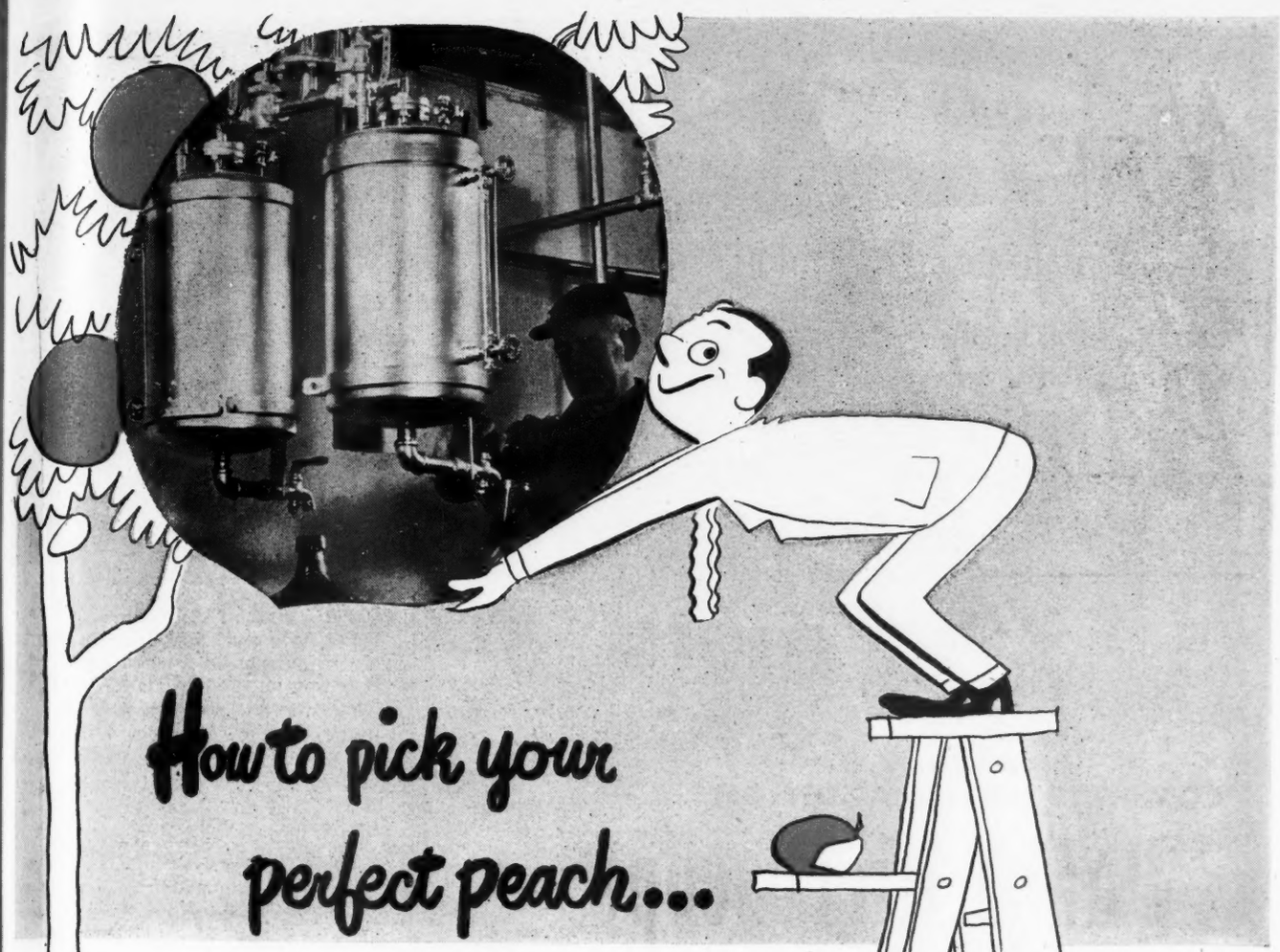
Speaking of the scope of the Cement Institute Decision, here is what the FTC lawyers wrote in their brief:

"Arguments will no doubt be advanced that it (the Cement Institute Decision) would necessarily result in condemning any universal delivered price system in any other industry, and would be . . . applicable not only to the heavy industrial products here, but to chewing gum, candy, magazines, and a host of other common articles of commerce which are sold on a universal price. Such argument is without foundation."

Citrus Promotion

THE FLORIDA CITRUS COMMISSION has adopted sweeping revision of its sales promotion of both fresh and canned products.

The field force will be more than doubled, with employment of two women dietitians or home economists to promote citrus products in the Federal



How to pick your perfect peach...

stick to NORDA

Make your product even more of a favorite. Flavor it with Norda Peach.

Norda Peach Flavor competes with fresh fruit in sun-gold peach orchard richness. It's the true peach goodness that people like. Both genuine and imitation Norda Peach have the real fruit character.

Insist on Norda, because Norda insists on excellence. Every flavor, extract, and oil produced in the big, modern Norda plant is as perfect for its purpose as we know how to make it. Our concentration on quality serves you well.

Try Norda Peach Flavor . . . and the other fine flavors. . . . Send for free samples and Flavor Catalogue today. Your own test is the best way to find out. Write us now.

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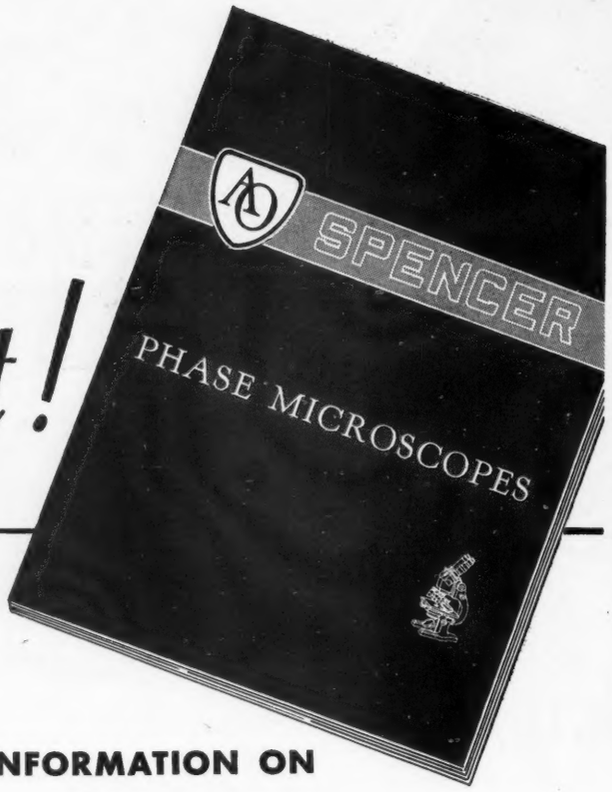

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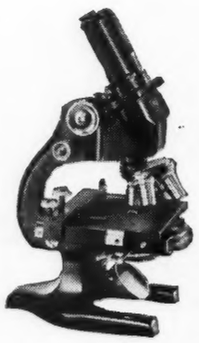
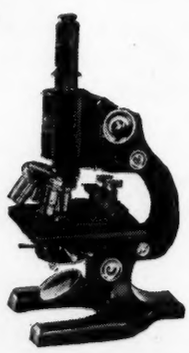


Phase Microscope No. 18MLS



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Wide World

WEED CONTROL

Robert Myer and Foster Silbaugh (top) use a plane to spot weed infestation on farms in Humboldt County, Iowa. Air view (above) reveals weed patch in upper left corner of a field. Location is marked on map, and farm owner is advised to get busy clearing out infested area.

school lunch program, and a woman to operate a testing kitchen at the commission's headquarters in Lakeland.

Another move approved employment of a beverage specialist to work with bottlers, vending machine operators, and dairies.

Boost in Express Rate Irks the Fish Shippers

WHEN the Railway Express Agency sent out notification to shippers of fresh fish and shellfish, June 17, that it was going to change the classification of rates, it brewed itself a fine storm.

Via REA, a shipper now expresses fish and shellfish with ice, by adding 25 percent to weight of the fish and then paying the express rate for the weight of fish plus 25 percent. But under REA's proposal he would have to pay the shipping charge for the weight of the fish plus 50 percent.

The 25 percent method of paying for cost of hauling ice has been of many years standing. The express rate per pound for hauling fish has gone up from time to time, but this standard 25 percent addition has not as yet changed.

Shippers take the bald view that REA's plan is just a means of getting more revenue without actually asking for an increase in the rates on fish. Accordingly, when REA announced the new rate as effective on or about September 5, the shippers were quick to protest.

REA first replied that it would be

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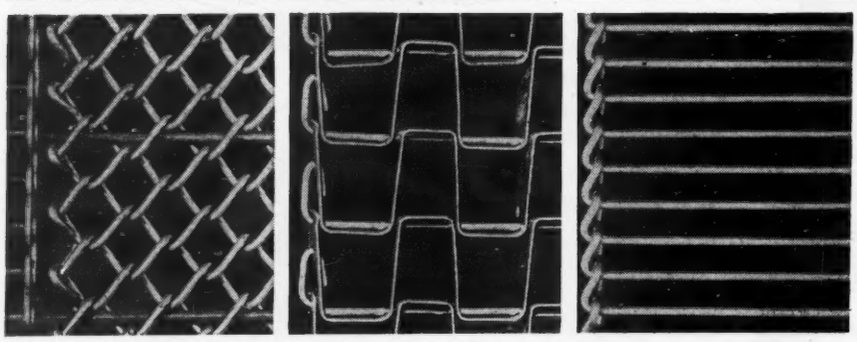

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ready to talk the matter over July 27, then later moved for a postponement of the discussions, finally setting the meeting over to September 14, at the Hotel Statler, in Boston.

Distributors are telling REA that if it gets such a rate, cost of transport by Railway Express will be so high that shippers will switch more and more to trucks. Meantime, USDA transportation experts are taking an active hand. Their job, as they see it, is to act in interest of commercial fisheries.

As yet, ICC is not officially involved, although it knows what is going on. REA is not likely to officially file the higher rates with ICC until after it has negotiated with the shippers.

After REA files officially, the shippers have ten days to protest, and if the protest has weight, ICC can suspend the application of the new rates pending public hearing. Then it goes through the ICC mill.

However, if REA can get some industry agreement—on some lesser increase, for instance—there is a possibility that an increase (though maybe not the present figure) could become effective without ICC action.

Government Programs Boost Fish Research

INVESTIGATION of several problems facing the fishing industry has gotten a boost from government and state-federal government programs recently launched or speeded up. Among them are projects designed to revive the Atlantic salmon runs, study of freezing of fish at sea, and research on canning new varieties of fish.

First phase of a research program to determine the practicality of freezing fish at sea, before bringing them ashore for processing and distribution, has been launched by the commercial fisheries branch of the Department of Interior's Fish & Wildlife Service.

Phase 1 aims to determine, for all the commercial varieties of fish, whether or not quality, flavor, etc., are adversely affected by freezing at sea, unfreezing ashore, and then perhaps refreezing again before being shipped to market.

ECA Will Ship Eggs Remaining in Surplus

THERE has been agreement by the Economic Cooperation Administration and the Commodity Credit Corp. to a plan under which approximately 37,500,000 lb. of frozen whole eggs—representing the remainder of stocks purchased by CCC for price support purposes in 1947—will be made available for shipment abroad under ERP sponsorship.

The eggs will be handled under the

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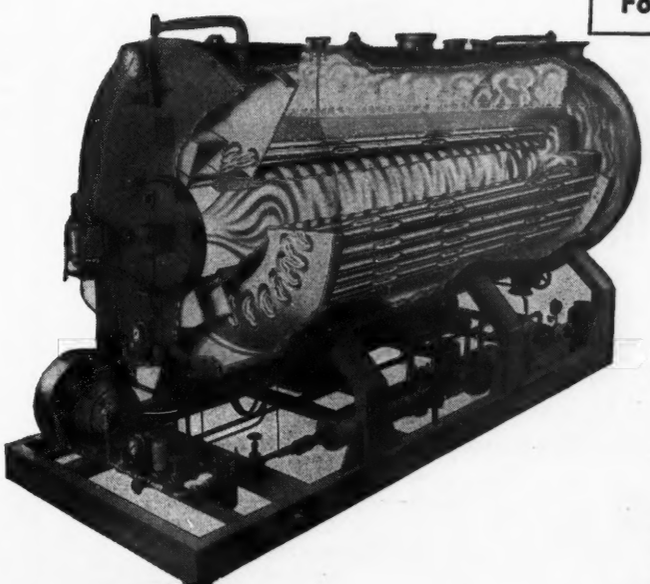

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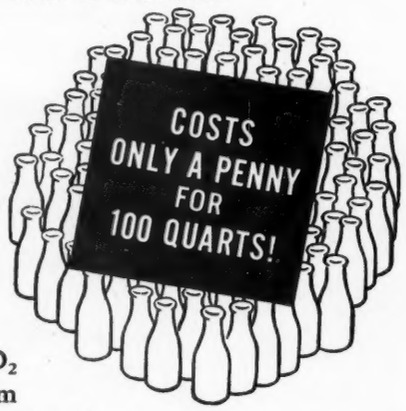

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provisions of Section 112 (e) of the Foreign Assistance Act of 1948, which authorizes the Department of Agriculture to pay up to 50 percent of the cost of designated surplus commodities made available for this program.

The frozen eggs amount to about 61,000,000 lb. Of this total, almost 12,000,000 lb. were sold to domestic outlets and to commercial exporters. Slightly less than 12,000,000 lb. are being dried by USDA for the school lunch program. The remainder will now be used outside the U. S.

Cuba and Puerto Rico Sugar Quotas Boosted

PRORATION of an additional 175,000 short tons, raw value, of sugar quota to Puerto Rico and Cuba, has been made by USDA, in accordance with the Sugar Act of 1948.

It is now expected that Hawaii will be unable, by 75,000 tons, to market the quantity previously expected and that the mainland cane sugar area will be unable to market 100,000 tons of its current quota.

SCHEDULE OF EVENTS

September

8–19—3d International food show, Parma, Italy.
11–19—Minneapolis Retail Growers Assn., National food show, Auditorium, Minneapolis.
13–15—American Soybean Assn., 28th annual convention, Hotel Peabody, Memphis, Tenn.
13–17—Instrument Society of America, National conference and exhibit, Convention Hall, Philadelphia.
19–21—Southern Bakers Assn., exposition and production conference, Municipal Auditorium, Atlanta.
20–22—American Meat Institute, 43d annual convention, Waldorf-Astoria, New York City.
20–23—University of Minnesota, dairy products institute, St. Paul Campus, St. Paul, Minn.
21–22—Purdue University, 4th industrial waste conference, Civil Engineering Bldg., Lafayette, Ind.
23–25—National Coffee Assn., annual convention, Mount Washington Hotel, Bretton Woods, N. H.
27–Oct. 1—Newspaper Food Editors' Conference, Waldorf-Astoria, New York City.

October

12–16—National Chemical Exposition and Industrial Chemical Conference, Coliseum, Chicago.
14–15—Packaging Institute, 10th annual forum, Hotel Commodore, New York City.
25–28—National Frozen Food Locker Assn., 9th annual convention and exhibition, Sherman Hotel, Chicago.
25–30—Dairy Industries Exposition, Convention Hall, Atlantic City. Also International Assn. of Ice Cream Manufacturers, Hotel Traymore (25–27), and Milk Industry Foundation, Chalfonte-Haddon Hall (28–30).
27—National Pickle Packers Assn., annual meeting, Sheraton Hotel, Chicago.

November

4– 5—American Butter Institute, 40th annual meeting, LaSalle Hotel, Chicago.
15–17—American Oil Chemists Society, fall meeting, Pennsylvania Hotel, New York City.
15–17—Grocery Manufacturers Assn., 40th annual meeting, Waldorf-Astoria, New York City.
15–19—American Bottlers of Carbonated Beverages, 2nd Postwar International Exposition, Convention Hall, Atlantic City, N. J.

Changes in Food Supplies

Production

Wheat flour production, in May, estimated at 22,700,000 sacks, was 2.7 percent above April, but 7.1 percent under May, 1947 output. Production was at the rate of 77.7 percent of capacity.

Lard rendered in June came to 172,736,000 lb., considerably above the revised May figure of 143,311,000 lb.

American cheese production, in June, was estimated at 106,440,000 lb. This represented a May-June increase of 4 percent, compared with a 6 percent gain a year ago, and a 4 percent average gain for the recent May-June five-year average.

Poultry, canned or used in canning during June, totaled 13,288,000 lb., an increase of 89 percent over June, 1947. The quantity of poultry canned or used in canning during the first six months totaled 73,408,000 lb., compared with 43,128,000 lb. for the same period last year.

Materials

Grain estimates tell their own story: Corn, 3,329,000,000 bu, 39 percent more than last year, and a new record. Wheat, 1,242,000,000 bu., second only to last year—but with 195,000,000 bu. carryover, total supplies are almost equal to 1947. Oats, 1,426,000,000 bu., second only to last year. Barley, 307,000,000 bu., compared with last year's 279,000,000.

European wheat crop was estimated, in July, at 1,450,000,000 bu., which compares with 1,015,000,000 last year, and a prewar average of 1,588,000,000 bu.

Green pea production estimates were down to 381,320 tons, July 15. This is 13 percent under 1947 output, but 4 percent more than the 1937-1946 average.

Snap bean production, on July 1, was estimated at 178,400 tons, 5 percent above last year and 3 percent over the 1937-1946 average.

Vegetable plantings that exceeded last year include: Beets, 27 percent; tomatoes, 17.5 percent; kraut cabbage, 70 percent; and green lima beans, 4 percent.

Dessicated coconut production in the Philippines has been increasing steadily. Only 5,600 tons were turned out in 1946. Production for 1947 is estimated at 35,500 tons, while 50,000 to 55,000 tons are anticipated this year. Last December's typhoon wiped out the 90,000-ton output that had been hoped for in 1948.

Chicks produced in commercial hatcheries, in June, totaled 97,367,000, 7 percent more than June, 1947, but 24 percent below the 1942-1946 average. Output of chicks for the first six months of this year totaled 945,316,000, a drop of 11 percent from the 1,061,116,000 produced during the same 1947 period. Eggs in incubators, on July 1, were 20 percent larger than a year ago, indicating a larger July hatch than last year.

Pecan production was indicated, in August, at 152,560,000 lb., 34,000,000 lb. greater than 1947, and almost 45,000,000 lb. above the ten-year average.

Storage

Frozen fish and shellfish held in storage, July 1, totaled 99,485,000 lb., which compares with 85,601,000 lb. held on June 1, 90,158,000 held July 1, 1947, and the July 1-five-year average of 78,881,000 lb.

Public cooler occupancy increased less than normally during June, resting at 67 percent on July 1, a rise of only 2 points from June 1 standings. The recent five-year average increase, during June 3, was 3 points.

Public freezer occupancy stood at 71 percent on July 1, which represented a 1 point increase for the month, compared with a five-year average June increase of 4 points.

Indexes

Business Week's index of business activity climbed to 196.1 for the week ending August 7, which compares with 195.5 for the preceding week, 194.4 a month previous, and 183.9 a year ago.

The commodity price index on food, compiled by the New York Journal of Commerce, was 213.1 for the week ending August 14. It was 211.9 for the preceding week, 210.2 for July, and 198.4 for August, 1947.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded September 1948 (thousands)	Total (thousands)
Bakery	$828	.....	$6,377
Beverages	345	.....	12,108
Canning and Preserving	80	.....	320
Cold Storage	138	.....	1,386
Confectionery	.....	82	2,335
Grain Mill Products	1,170	500	8,611
Ice, Manufactured	.....	.....	70
Meats and Meat Products	.....	.....	1,142
Milk Products	361	.....	4,454
Miscellaneous	2,675	620	9,746
	$5,597	$1,202	$46,549

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Cherry (Tame)	*Pineapple*
Cherry (Wild)	*Pistachio*
Cranberry	*Raspberry*
Currant (Black and Red)	*Root Beer*
	Strawberry
Grenadine	*Vanilla*
Grape	*Walnut (Black)*
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What Washington Thinks

By R. S. McBRIDE, Washington, D. C.

ORDERS ARE MANDATORY—The Selective Service Act of 1948 which is now governing the draft of young men for military service also provides for a draft on industry with respect to wanted industrial goods. Section 18 makes mandatory in any enterprise the acceptance of any order which the proper government agencies require of such firm. Not only must the order be accepted, but it must be given precedence over others, delivery must be made on the schedule indicated, and the kind, quality, and price may be fixed by federal officials. Thus the President and his designated agents have more peacetime power than ever before granted, even during a war. Let's hope the Administration is not too harsh.

HERSHEY AGAIN — General Hershey again has been named as Selective Service director. This means that to a very large extent deferments of young men under the draft law are going to be based on local judgment. The General has no sympathy with group deferments, and he can be expected to resist anything remotely resembling them. Food plant executives seeking deferment for employees should be guided accordingly.

FAT SUPPLY—The world supply of fats and oils continues to be subject to international agreement under FAO. The plan for 1948-49 has been set up on a tentative basis and is now before the participating governments for criticism and approval. Allotments for the next fiscal year represent about two-thirds of the total quantity used in prewar years by the same countries. Agreement on trade sources and destinations do not differ radically from last year—indicating that the world scarcity is little modified.

SPEEDING MATURITY—Chemical spray on pineapples is now able to reduce the long ripening period formerly needed for that fruit. This seems a safe conclusion after the recent Puerto Rico experiments, which have contributed in making the pineapple crop third in importance from the Island, under only sugar and tobacco in dollar value. Comparable maturity-control work may develop in other fruit and vegetable industries.

SUGAR CRITICISMS—Congress told the Department of Agriculture, under the Sugar Act of 1948, how it should establish production and import quotas for domestic, territorial, and insular supplies. As the Secretary of Agriculture has begun to apply that law, criticism has developed. It is obvious that the law is going to be used to maintain high sugar prices, a result most desirable politically in an election year. It looks as though the sugar users of the country, both housewives and industry, have not sufficiently anticipated the effect of this law in upping sugar prices for the indefinite future.

RE-EMPLOYMENT RIGHTS—The new Selective Service Law again establishes re-employment rights for individuals who leave commercial employment in response to the draft. It is not too soon to find out exactly what those rights are for each individual company situation. Most of us have too soon forgotten the headaches we had when the GI's came back and asked for their old jobs. Apparently this problem of re-employment is to continue with us indefinitely.

FUEL ECONOMY—Every possible plant improvement must be made to secure fuel economy during the coming winter, when the cost of fuel will be higher than ever before. And even more compelling will be the threat of fuel scarcity which booming industry may bring about during the 1948-49 cold weather.

WORSE FLOODS—The devastating floods of the Columbia River this year are merely a spectacular example of the way in which river development has increased the opportunity for flood damage. Far too many establishments seeking water frontage have counted on the normal high water mark as the limit of hazard. But that is far from

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being safe. Restricted river channels and substantial man-made modifications upstream have often intensified high water problems. Every downstream enterprise is necessarily concerned about upstream channel restriction. Smart managements on the water front are now investigating all those factors that hitherto have seemed negligible from their local point of view.

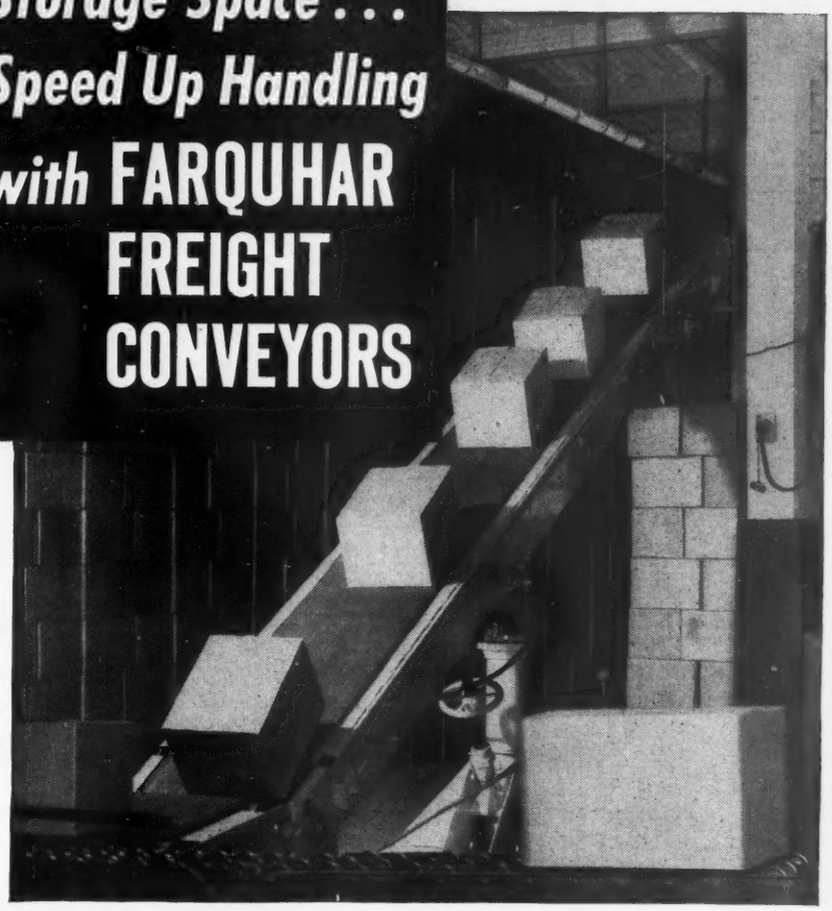
WE PAY FOR LOSSES—The food industries are in effect paying for the hundreds of millions of dollars worth of food raw materials annually destroyed by insects and other pests. The present national economy virtually insures a certain gross income to agriculture. If that income can be obtained from larger sales of crops, by virtue of less destruction by pests, then the food industries will benefit in a somewhat more favorable unit price for raw materials. On this basis it becomes evident that there is no other agency in America more directly interested in stimulating pest control by newly established chemical methods that have been proven effective in practice.

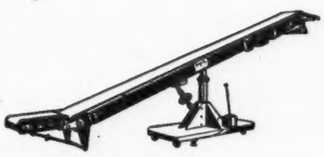
INTERSTATE TRUCKS — Some folks have made a considerable issue of the recent ICC decision declaring that owners of truck fleets doing interstate hauling are not common carriers in most cases. That decision was important only in emphasizing that food manufacturers, for example, can continue to haul their products across state lines without becoming involved in federal control of rates charged for such delivery.

POTATO FLOUR—Large quantities of surplus potatoes are being processed for manufacture of potato flour, especially with idle equipment in distilleries. Practically all of this flour is going abroad for relief feeding in Bizonia—where potato flour is welcomed, since potato bread has long been an accepted item in the European diet. One wonders whether a new comparable American market may be developed by some clever potato flour makers. They will never have a better chance to try.

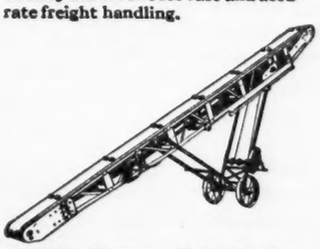
WINTER TESTS—Recent work done in testing of packaging methods and packaging materials during the summertime provides the most rigorous trials. Especially effective are tests directed to the question of prevention of loss or gain of water. But as winter conditions approach, comparable tests are impracticable unless special humidity rooms are provided. Some of the government agencies doing other kinds of checking have such test rooms. It looks as though food research laboratories might well consider similar equipment, if year-round investigation is to go on. Cost of the apparatus and its operation is considerable, but readiness to supply quality packages next spring may depend on having adequate test rooms available this winter.

Eliminate "DEAD" Storage Space . . . Speed Up Handling with FARQUHAR FREIGHT CONVEYORS





Farquhar Conveyor Model 435-FM with hydraulic lift for fast and accurate freight handling.



Farquhar Conveyor Model 431-EW for heavy-duty handling of bags, boxes, cartons.

FARQUHAR Freight Conveyors (Model 435-FM shown here) move bags, bales, boxes, cartons and bundles *faster, cheaper, easier,* when your handling operations call for loading, piling, stacking, horizontal conveying, moving from floor to floor or eliminating *"dead"* storage space.

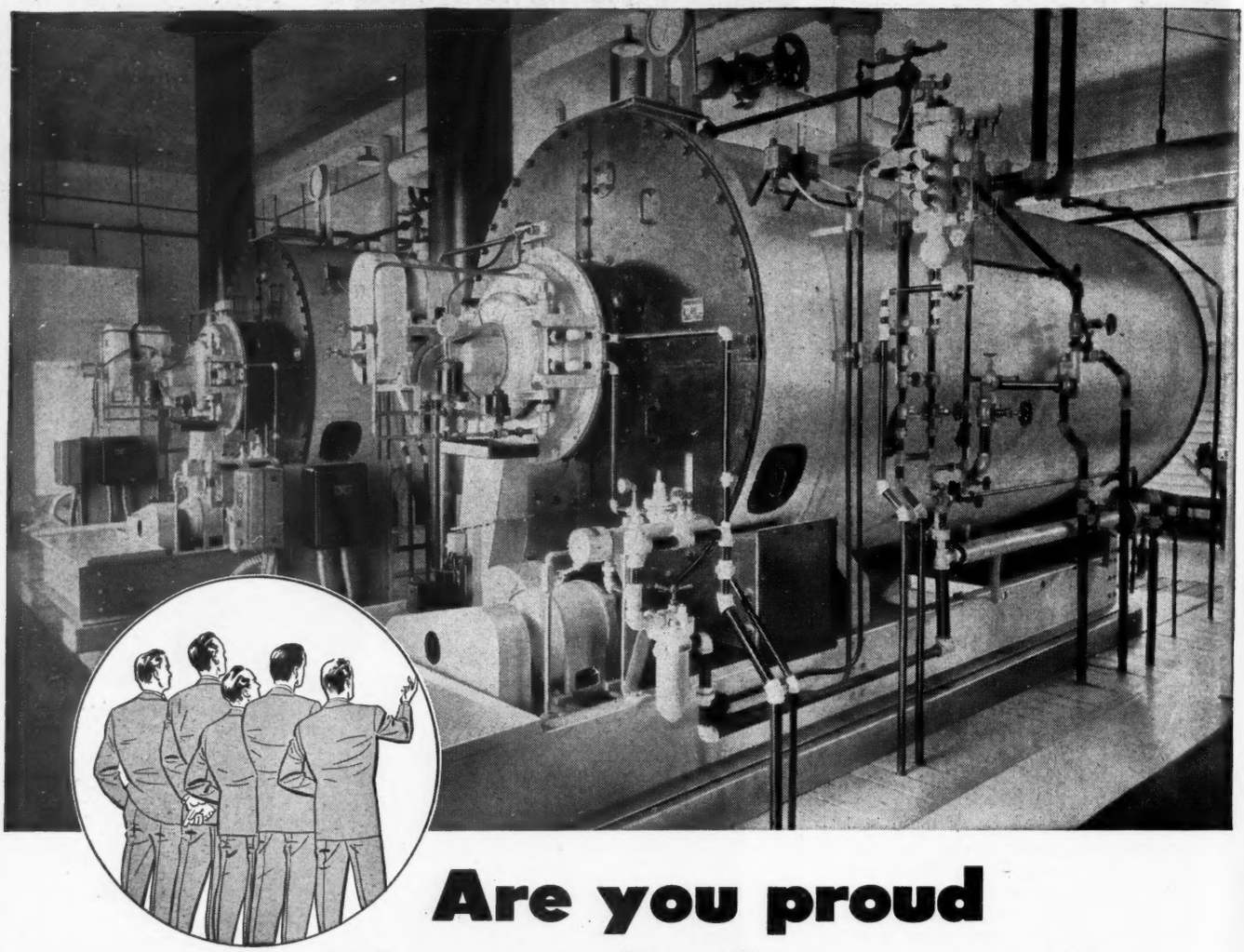
All Farquhar Freight Conveyors are designed with one purpose in mind . . . *to cut handling costs,* no matter what the handling problem may be. Farquhar Conveyors are flexible, can be set up singly or in tandem. Models available in various sizes and mounting styles.

See Farquhar first for the right materials handling conveyor for your job. Tell us your handling problem . . . we'll see that you get the information you need.

Write A. B. FARQUHAR COMPANY, 205 Duke Street, York, Pennsylvania, or 628 W. Elm St., Chicago 10, Ill.

HYDRAULIC PRESSES
FARM EQUIPMENT
FOOD PROCESSING AND
SPECIAL MACHINERY

Farquhar PORTABLE OR PERMANENT MATERIALS HANDLING CONVEYORS



Are you proud of your boiler room?

Cleanliness and efficiency usually go hand in hand. Replace your old inefficient, unsightly steam plant with a modern Cleaver-Brooks "packaged" steam generator. Its modern design, its well integrated construction — its clean, smokeless efficient operation (no ashes, dirt or soot to contend with) assure a show place boiler-room like the one illustrated above.

There are more "packaged" Cleaver-Brooks steam generators serving a wider range of steam needs than any other make. Cleaver-Brooks units have been serving all industry for more than 15 years. Check your operating budget — do your steam costs seem excessive? Cleaver-Brooks will be glad of the opportunity to work with you to see if they can be profitably and substantially lowered. Remember, Cleaver-Brooks can help you plan your steam generation needs to meet not only current loads but to provide for future expansion as well.

- Low operating costs: unsurpassed guarantee: — 80% thermal efficiency from full load down to 30% of its rating:
- Quick steaming — for any emergency or fluctuating loads — through high heat transfer.
- Fast installation. No special foundation needed. No smoke-stack required, only simple roof-high vent. Saves space, fits into low head-room locations. Oil or gas firing provides clean smokeless operation.
- FACTORY-FINISHED AND TESTED—a "packaged" unit meeting all code requirements.
- SIZES: 15 to 500 h.p., pressures from 15 to 200 p.s.i. (Write for bulletin and complete information.)

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WRITE on your business letterhead for the Free Steam Cost-Calculator — a ready-reference slide rule showing the comparative steam costs when using oil, gas, or coal as fuel.

Cleaver-Brooks

"Packaged" STEAM GENERATORS

HAVE SERVED INDUSTRY FOR MORE THAN FIFTEEN YEARS

MEN · JOBS · COMPANIES

INDUSTRY

The **Borden Co.** has begun production of pasteurized process Gruyere cheese at the Lakeshire-Marty plant in Monroe, Wis. Equipment was designed and built in Switzerland. Capacity of plant is 9,000 6-oz. packages daily.

Canada Dry Ginger Ale Co., Inc., Maywood, Ill., is continuing its plant modernization and expansion program with the construction of a 40,000-sq.-ft. building addition to provide increased warehouse and garage facilities.

Carr-Consolidated Biscuit Co. has purchased business and physical assets of J. S. Ivins' Son, Inc., 113-yr.-old Philadelphia cookie and cracker bakery. Ivins company production and distributing organization will remain intact.

Chicago Almond Products Co., manufacturer of almond paste and nut toppings for baking industry, is constructing new single-story brick plant containing 15,000 sq. ft. of floor space.

Clinton Industries, Inc., has negotiated a seven year loan for $6,500,000 with a group of midwestern banks. Money will be used to complete expansion program at Clinton, Iowa, plant and to provide additional working capital. Company recently entered frozen food field through acquisition of Snow Crop Marketers, Inc.

Continental Nut Co. has opened sales offices in Matson Building, San Francisco.

Curtice Brothers, Inc., Rochester, N. Y., has installed new canning machinery and will employ 200 additional workers as a result of a contract to pack fruit and vegetables for Gerber Products Co.

Dundee Grape Juice Co, Inc., Dundee, N. Y., has filed voluntary petition of bankruptcy listing outstanding debts of more than $250,000.

Eckhart Milling Co., Chicago, is continuing its $750,000 plant modernization program with construction of concrete and steel structures six to eight stories high to replace present buildings.

Felbro Food Products, Culver City, Cal., is new name and address of firm formerly known as Del-Mar Quality Food Co.

General Foods Corp. is now past halfway mark in its $1,000,000 modernization program of The Colonial Salt Works, Akron, purchased in 1946.

A. E. STALEY, JR.

President and chairman of board of A. E. Staley Mfg. Co. He has been appointed head of Economic Cooperation Administration to Norway and will have rank of Minister under foreign reserves.

ANDREW A. BORLAND

Retiring professor in charge of Dairy Husbandry Department, Pennsylvania State College. He has been presented certificate of honorary recognition and life membership in the American Dairy Science Assn.

DR. JOSEPH G. LEEDER

Formerly director of research with Ramsey Laboratories, Cleveland, he has been appointed associate professor of dairy manufacturing at College of Agriculture, Rutgers University.

DR. ROBERT J. SUMNER

Resigning as a chemist in laboratories of American Institute of Baking, he now assumes new duties as assistant director of research with Anheuser-Busch, Inc., St. Louis.

Joyce Seven-Up Co., Chicago, began production in August in its new one-story building containing over 43,000 sq. ft. of floor space.

National Biscuit Co. is reported to be preparing plans for construction of a new bakery in Elmira, N. Y.

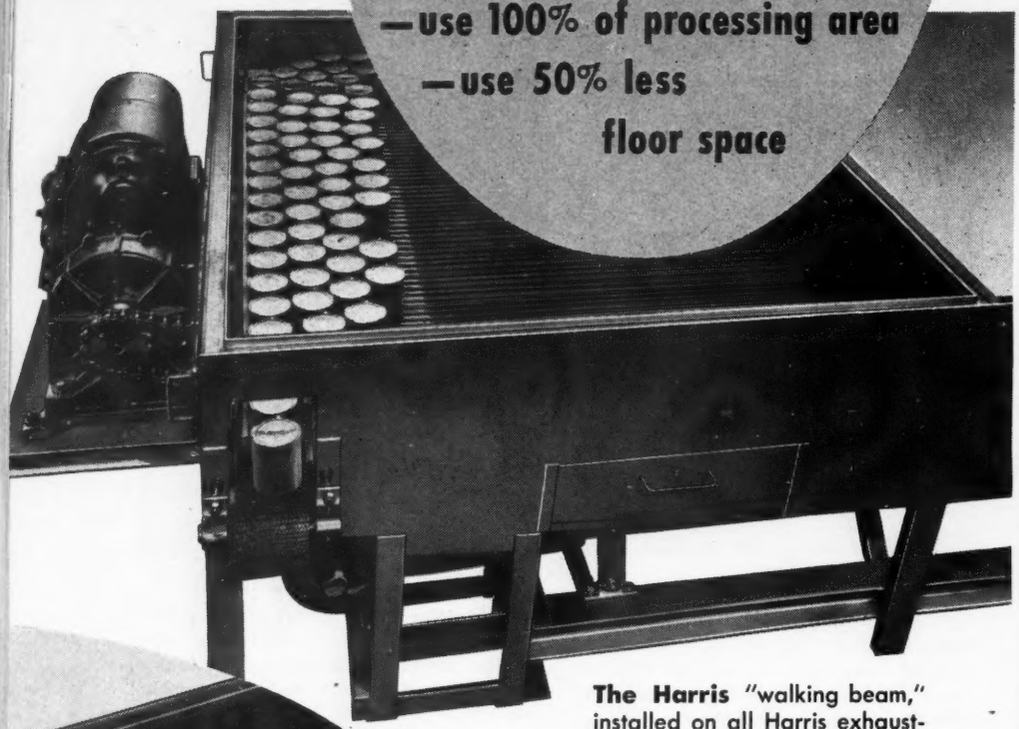
Stokely Foods, Inc., expected to have completed the rebuilding of their warehouse, offices and shipping room, at Celina, Ohio, by late August. The building had been destroyed in a $500,000 fire, April 13.

Wayne Candies, Inc., Fort Wayne, Ind., has purchased plant building of American Fork & Hoe Co. Plans are to remodel plant into a modern streamlined factory. Production activities are expected to start early in 1949.

Fire Losses—P. H. Postel Milling Co., Mascoutah, Ill., grain elevator and 90,000 bu. of wheat, burned with loss approximated at $400,000 . . . Roof of expeller-house at A. E. Staley soybean plant, Decatur, Ill., was ignited by combustion of soybean dust, with estimated $1,000 loss.

HARRIS

EXHAUSTERS,
PASTEURIZERS, COOLERS
—use 100% of processing area
—use 50% less
floor space



The Harris "walking beam," installed on all Harris exhausters, pasteurizers and coolers, brings real savings in equipment, processing and maintenance costs.

This system moves the entire load through the processing area at one time, without bumping, banging or damage. Basis is a grid floor alternating with a "walking" grid. Processing time is controlled by "VARI-Speed."

You get 100% use of the processing area. There are no pusher bars, guides or chains to waste this space.

The few working parts, as well as grease points are outside of the processing area. Maintenance and service is greatly simplified.

Your requirements for processing time, temperature and capacity can be met, using the efficient Harris "walking beam" system. Remember—you'll use smaller equipment for the same production; you'll use 50% less floor space.

1. Container rests on stationary grid. 2. "Walking Beam" grid raises, lifts container; moves it forward. 3. "Walking Beam" recedes, lowers container to stationary grid; returns to (1) and repeats cycle.
ENTIRE LOAD MOVES AT ONE TIME.

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UNITED WELDING &
MANUFACTURING COMPANY
Division of HARRIS (H) Enterprises

PERSONNEL

Alvin J. Alton, formerly research chemist with Beatrice Foods Co., Chicago, has accepted position with Taylor Freezer Corp., Beloit, Wis., and will direct product development department.

William E. Anklam has been named director of new products commercial research for General Mills, Inc., Minneapolis. He succeeds A. E. Burnett, deceased.

Bradford W. Brown, packaging consultant formerly with Hummel & Co., Milwaukee, has been named research executive in the Milwaukee office of Container Laboratories, Inc.

Ernest C. Brown has been appointed manager of bulk goods department of Hills Bros. Co., New York City, packer of Dromedary Food Products.

George A. Farrah, formerly technical superintendent at Manayunk, Pa., plant of Container Corp. of America, has joined staff of Container Laboratories, Inc., Chicago.

Dr. Herbert Fineberg has been appointed chief chemist of Glyco Products Co., Inc., Brooklyn, N. Y., and Natrium, W. Va.

E. G. Grab, Jr., former director of Food Processing Research Section of TVA, Knoxville, Tenn., has been appointed research associate in Food Research Dept. of Heekin Can Co. He will make his headquarters in Cincinnati.

George W. Greenwood, who has been associated with Whitman's Chocolates for 22 yr., has now joined Norris, Inc., Atlanta, Ga., as vice-president in charge of manufacturing and packaging.

R. A. Larson, associate secretary of Ohio Dairy Products Assn. since Jan. 1947, is now executive-secretary of Indiana Dairy Products Assn.

Maurice H. Lockwood has been named a vice-president of International Minerals & Chemicals Corp. He will be in charge of plant food division.

Stephen Kwasny, formerly assistant foreman, Lasting Flavor Dept., Wilson & Co., Chicago, has been promoted to foreman of that department. He succeeds Vincent Gohman, recently made traveling supervisor of sausage and lasting flavor operations in the general superintendent's office.

W. J. Mahan, formerly staff technologist at N. Y. research and development headquarters of General Foods Corp., has been named technical director of company's Diamond Crystal Salt Div., St. Clair, Mich. He succeeds Dr. J. Avery Dunn, who was appointed act-

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for quality in every piping item

It's as simple as that! *Everything* from Crane is the easy way to specify "Quality" in all piping equipment. Whether it's valves, fittings, accessories or fabricated piping . . . one catalog and one order quickly bring everything you need from your nearest Crane Branch.

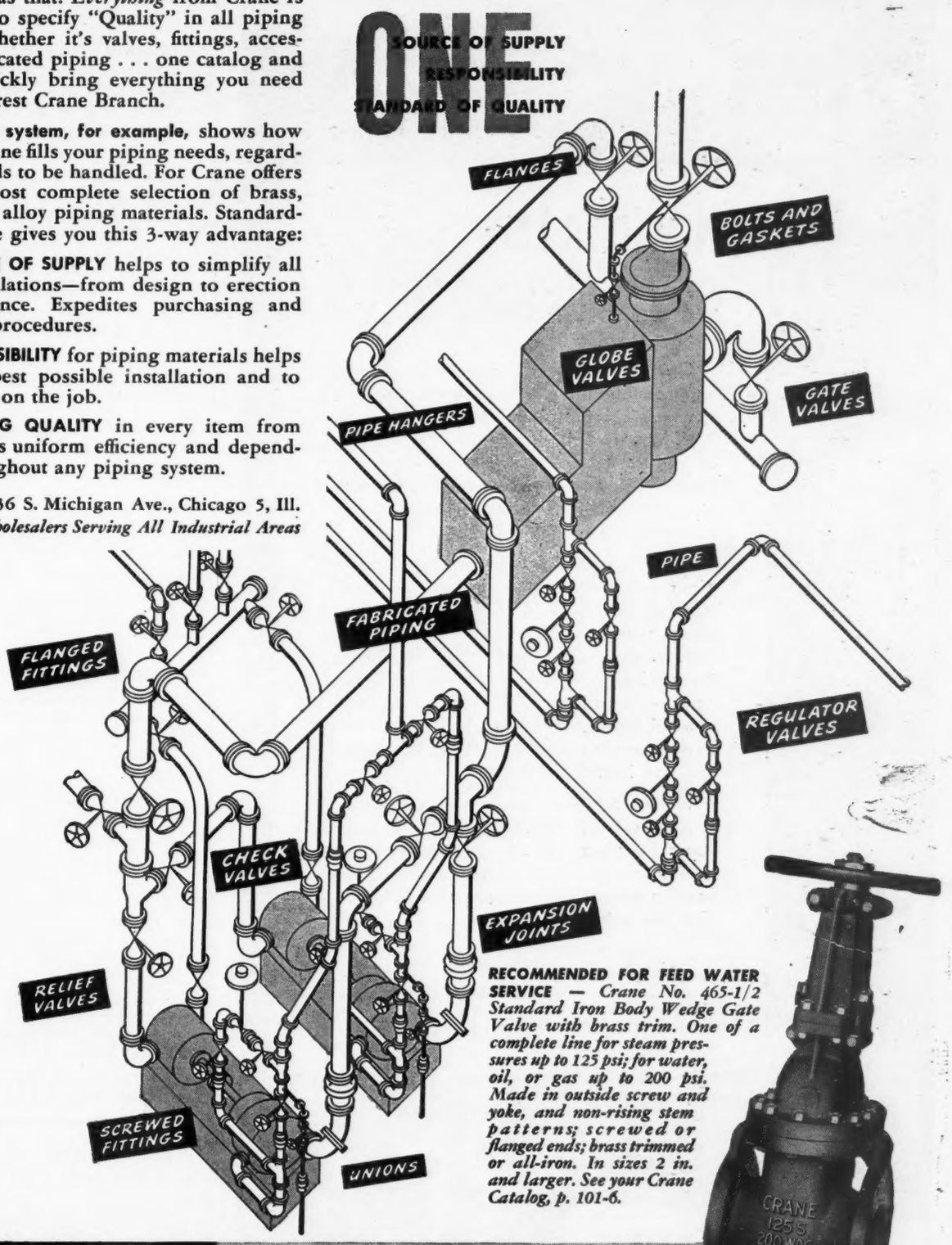
This boiler feed system, for example, shows how completely Crane fills your piping needs, regardless of the fluids to be handled. For Crane offers the world's most complete selection of brass, iron, steel and alloy piping materials. Standardizing on Crane gives you this 3-way advantage:

ONE SOURCE OF SUPPLY helps to simplify all piping installations—from design to erection to maintenance. Expedites purchasing and store-room procedures.

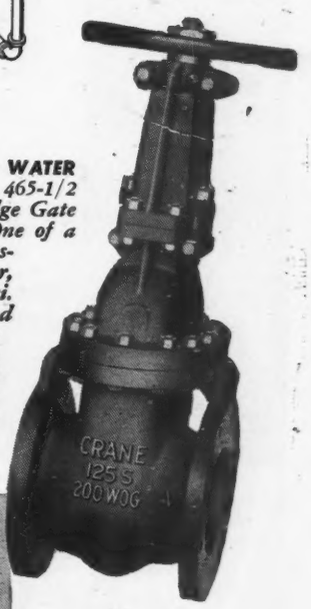
ONE RESPONSIBILITY for piping materials helps to get the best possible installation and to avoid delays on the job.

OUTSTANDING QUALITY in every item from Crane assures uniform efficiency and dependability throughout any piping system.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



RECOMMENDED FOR FEED WATER SERVICE — *Crane No. 465-1/2 Standard Iron Body Wedge Gate Valve with brass trim. One of a complete line for steam pressures up to 125 psi; for water, oil, or gas up to 200 psi. Made in outside screw and yoke, and non-rising stem patterns; screwed or flanged ends; brass trimmed or all-iron. In sizes 2 in. and larger. See your Crane Catalog, p. 101-6.*



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PIPE • PLUMBING
AND HEATING

CRANE

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Newton's Law
Still Holds Good
Gravitation doesn't appear as a plant expense but it's a big factor in keeping costs up. Not even a feather will raise itself into working position, move sideways or deposit itself where needed. Human or steel muscles are needed to lift and move raw materials, semi-finished goods and finished products.
Where heavy loads are concerned, plant engineers don't depend on human muscles, but think in terms of a Shepard Niles overhead traveling crane. With a multitude of sizes and types available, there's bound to be one to fit your own needs — and a trained, experienced engineer of America's leading builder of overhead traveling cranes will help you select the one best fitted for your needs.
No matter what size or style Shepard Niles overhead traveling crane is selected to do your job, you can depend on sound design, rugged and precise construction, reserve capacity and economical, trouble-free operation year after year.
★ Shepard Niles engineers may feel an electric hoist is better fitted for your needs than an overhead traveling crane. Their recommendations are unbiased because Shepard Niles makes both. Only the type crane or hoist best suited for your job will be recommended.
Shepard-Niles
CRANE & HOIST CORPORATION
422 SCHUYLER AVE. • MONTOUR FALLS, N. Y.

ing sales manager of Atlantic Gelatin Division.

Harry N. Neureuter has been named president of Hasselbeck Cheese Div. of Borden Cheese Co., Buffalo. He succeeds his brother, Clarence H. Neureuter, who died May 30.

Joseph W. Odlum, formerly assistant general manufacturing manager at Post Cereals Div. of General Foods Corp, Battle Creek, Mich., has been named manager of manufacturing and engineering at Atlantic Gelatin Div.

P. E. Petty, supervisory assistant over Swift & Co. packing plants in the president's office, has been elected a vice-president of the company's board. His new duties will be as assistant to President John Holmes.

J. A. Shellenberg, head of milling industry department, Kansas State College, has begun a study of food conservation and grain storage problems in Costa Rica and El Salvador for Institute of Inter-American Affairs and United Nations Food & Agricultural Organization.

Carl F. Cori, professor of biochemistry, Washington University, St. Louis, has received Willard Gibbs Medal, awarded by Chicago Section of American Chemical Society, for his outstanding discoveries in sugar utilization by the human body.

F. W. Quigley has been named district supervisor in charge of plants and warehouses of Midwest Dairy Products Corp., DuQuoin, Ill.

Dr. H. W. Vahlteich, vice-president in charge of research and quality control, Best Foods, Inc., has been named vice-chairman of Fall meeting of American Oil Chemists' Society.

C. R. Weaver, former manager of Miami plant of American Bakeries Co., has been appointed manager of Atlanta plant to succeed R. C. Hicks, resigned.

ASSOCIATED INDUSTRIES

Bakelite Corp., unit of Union Carbide & Carbon Corp., announces appointment of John D. Benedito as manager of newly created Extrusion & Molding Materials Div., with headquarters in New York City.

Brown Instrument Div. of Minneapolis Honeywell Regulator Co. has transferred G. L. Ferguson, sales engineer, from Atlanta to Charlotte office.

Harrington & King Perforating Co.

Here's how to S-t-r-e-t-c-h your warehouse 10%* without moving a brick

DOCK

PLATFORM

AISLE

AISLE

Designed expressly for food warehousing, the Crescent "Aisle Saver" is the first—and only—truck to right-angle stack from an eight-foot aisle, with ample room for maneuvering and spotting.

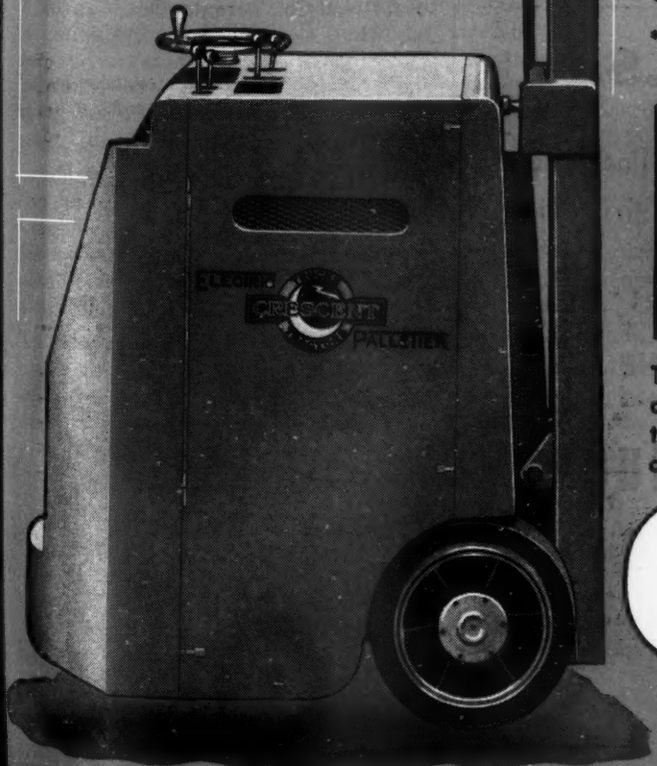
You reduce your aisles to 8-foot width and get more than 10%* additional storage space.

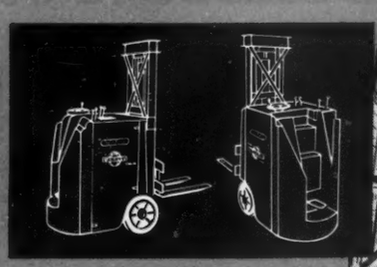
Aisle areas shrink, pay space swells, and mechanical handling becomes practical and profitable for every food warehouse—large or small.

Let Crescent show YOU how to save time, manpower and money with this food handling champion.

*Average based on figures from nation-wide study.

Crescent Model LHVH
2000 lbs. at 34" load length
1750 lbs. at 42" load length





The "Aisle Saver" bulletin contains complete information. Write for your free copy today.

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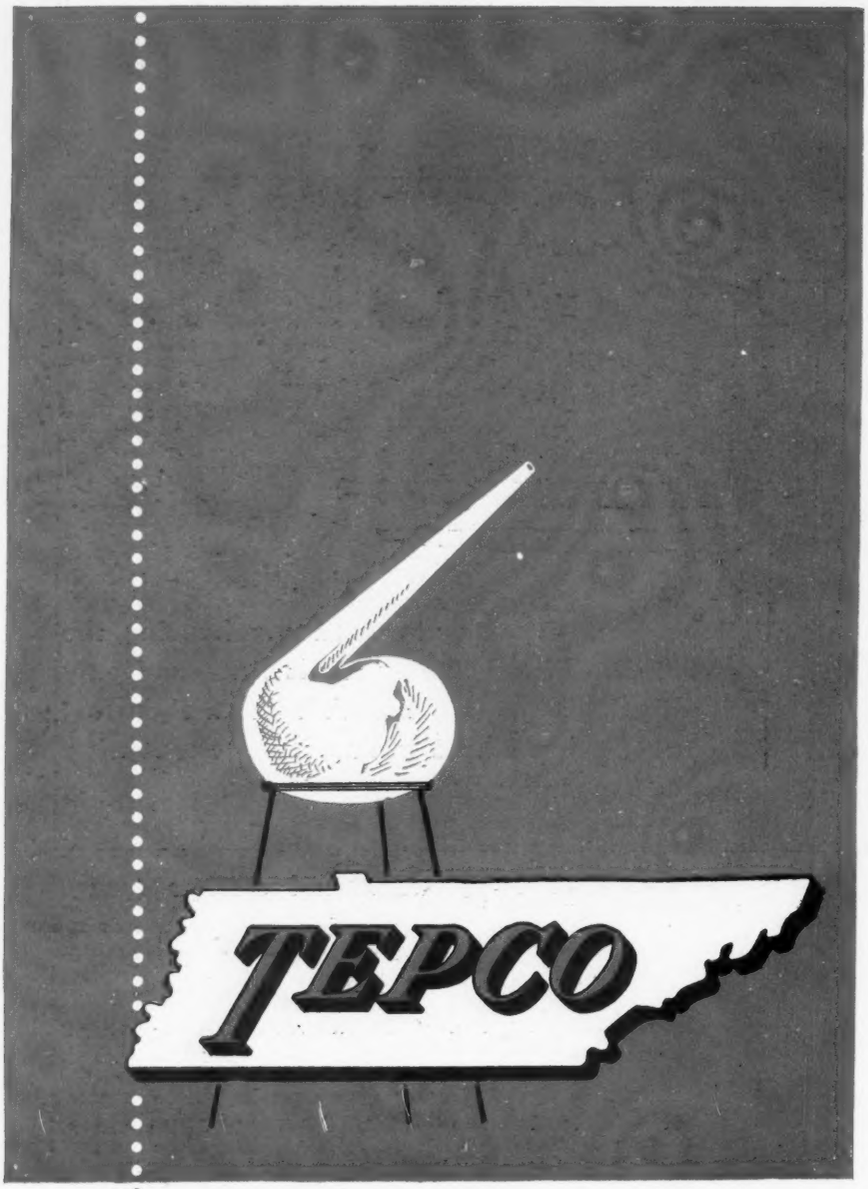
INDUSTRIAL TRUCK AND TRACTOR SPECIALISTS SINCE 1917



Sodium Benzoate U.S.P.

Absolutely of the highest purity, fine-flake Tepco Sodium Benzoate (U.S.P.) gives uniformly BETTER SOLUBILITY.

PROMPT SERVICE TO ANY PART OF THE U. S.

Tennessee Products & Chemical Corp.

General Offices: Nashville, Tennessee
Eastern Sales Office: 350 Fifth Avenue, New York 1, N. Y.

has appointed David K. Colesberry as general sales manager.

S. C. Johnson & Son, Inc., Racine, Wis., announces retirement from the company of P. M. Peterson, vice-president in charge of sales, after 40 consecutive years of service.

De Laval Steam Turbine Co., Trenton, N. J., announces retirement of H. L. Watson as president of the company and election of G. W. Smith, Jr., as his successor.

Milprint, Inc., Milwaukee, recently announced the retirement of the company's founder, H. T. Heller, as president. He will be succeeded by William Heller. The founder will remain as chairman of the board.

St. Regis Paper Co. has installed a battery of four automatic Packaging machines at National Biscuit Co. plant in Toledo, Ohio. Installation is reported to be largest in flour milling industry.

Turco Products, Inc., Los Angeles manufacturer of specialized industrial cleaning compounds, has chosen McCook, Ill., as site of its new, modern plant to augment present company facilities in Chicago, L. A., and Houston.

DEATHS

A. E. Burnett, director of new products commercial research for General Mills, Inc., died in an auto accident near Proctor, Minn., July 4.

W. H. Carruthers, 75, founder of Ideal Bread Co., Toronto, Ont., Canada, July 21.

George W. Dolan, 46, chairman of board of directors of Mathieson Chemical Corp., after a brief illness, July 24.

Lamarcus Colquitt Edwards, Sr., 78, leader in Florida citrus industry, July 6 while visiting friends in Canton, N. C.

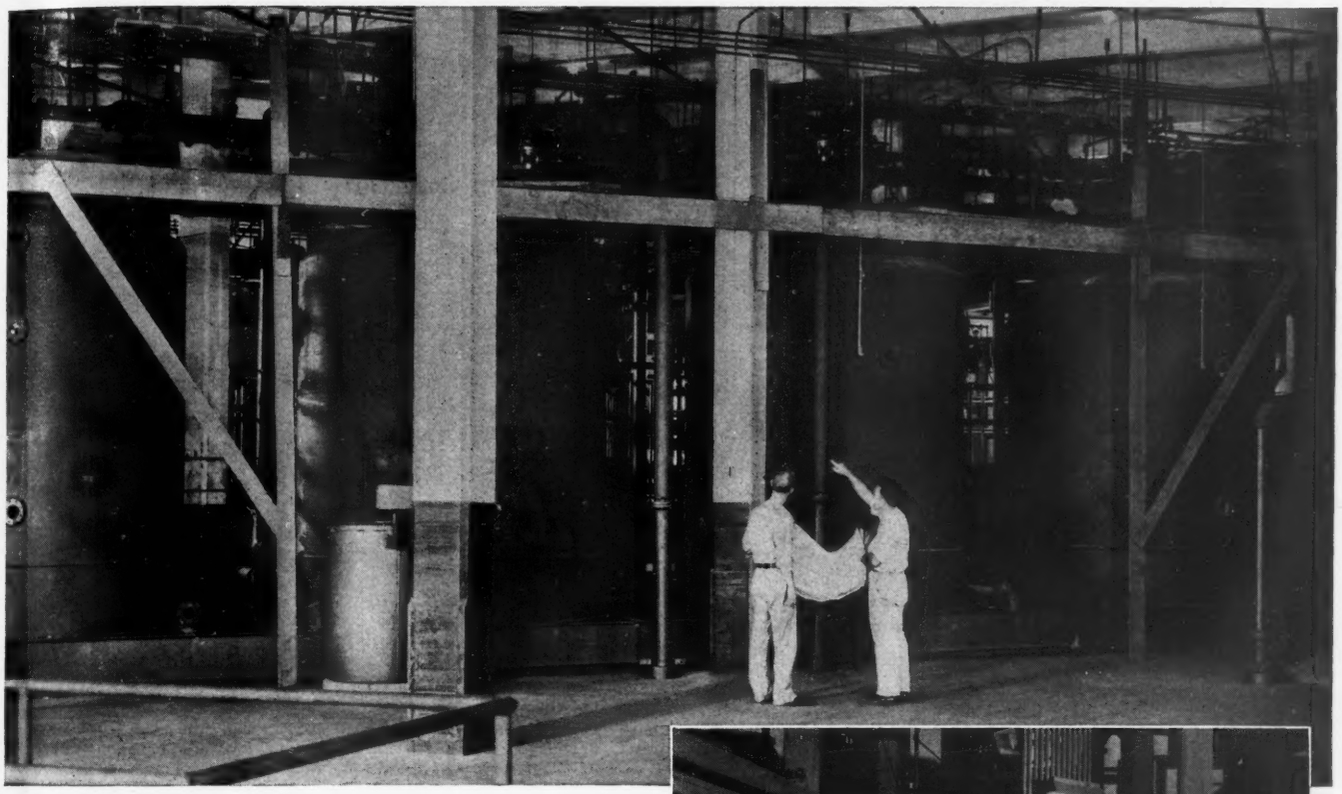
Harry Holland, 64, former president of Holland Farms, Inc., Brooklyn, July 3 at his home in Neponsit, L. I.

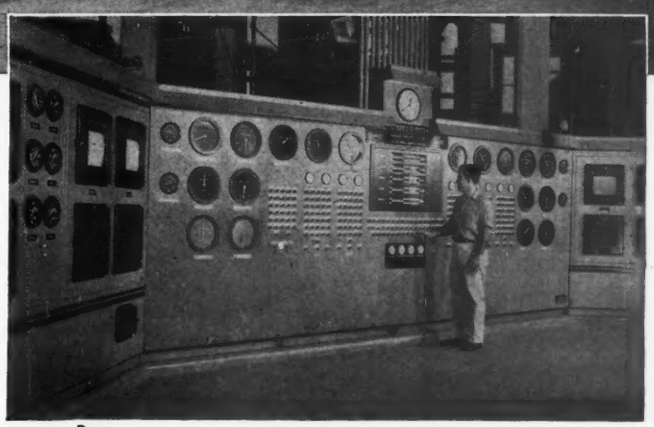
William H. Kelley, chairman of board of Kelly Co., manufacturer and wholesaler of peanuts and nut products, July 17, at his residence in Cleveland Heights, Ohio.

Julius Koch, 67, president of E. Guckenheim Bakers Supply Co., June 28 at his residence Vinita Park, St. Louis County, Mo.

Bernard D. Rubin, 55, president of Sweets Co. of America, July 6, at his home in New York City.

De-Ionization GIANT





now producing edible syrup from formerly non-usable pineapple juices

Now in commercial operation, the Dorrco De-Ionization System at the Dole-Hawaiian Pineapple Company plant in Hawaii represents a milestone in ion-exchange progress.

This installation . . . by far the largest of its kind . . . is stripping previously inedible pineapple juices of their ash and organic non-sugars prior to evaporation. The product is an edible sugar syrup which is being used to replace an estimated 8,000,000 lbs. per year of purchased sugar for sweetening canned pineapple.

Credit for much of the development work underlying this outstanding installation belongs to Dole-Hawaiian Pineapple Company—a progressive leader in its field. Significantly, The Dorr Company was selected to engineer the process, design the plant, supply the equipment and supervise the initial operation — in short to provide a complete engineering service.

The successful and proven application of ion-exchange techniques to the upgrading of sugar-bearing solutions offers unlimited possibilities for increased profit to fruit processors. Inquiries are invited from those desiring to investigate the application of these techniques to their own problems.

TOP—4 of the 10 cells comprising this installation during final stages of erection.

ABOVE—Closeup of the control station.

DORRCO

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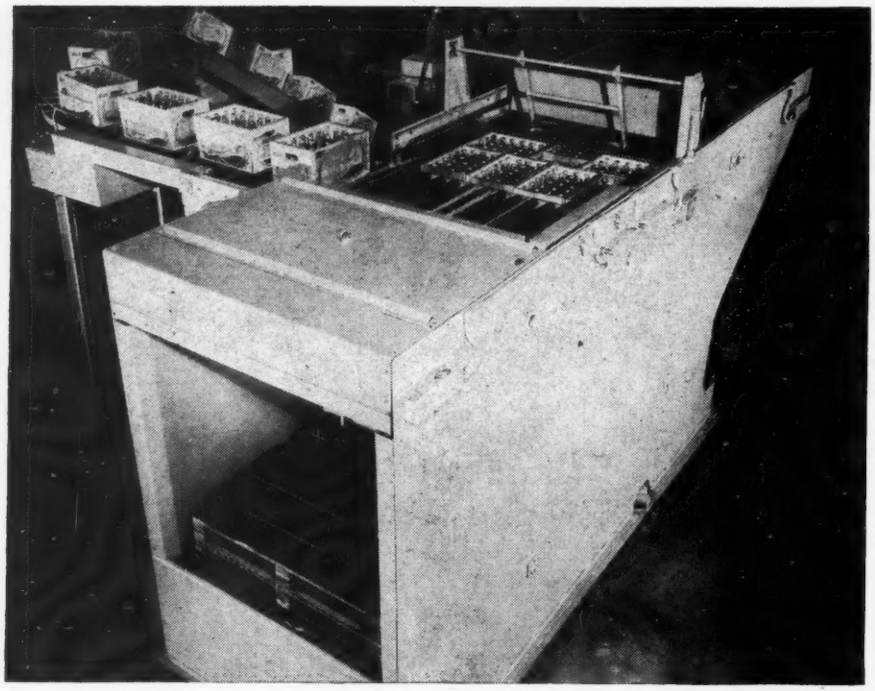
Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

RESEARCH — ENGINEERING — EQUIPMENT

DORR

FOOD EQUIPMENT NEWS



Versatile Filled-Container Pallet Loader 1

FOR automatically palletizing filled shipping containers, a machine of new design is reported by Production Aids, Inc., Dept. I, N. Hollywood, Cal. Taking the cases direct from a conveyor line after they have been sealed, unit loads them onto empty pallets, cross-tying them whenever necessary, to make a complete pallet load, ready to be picked up by a lift truck for warehousing or shipping.

Versatility of machine embraces applications in practicaly every type of manufacture where cartons or cases require palletization. Packages arriving from the case sealer may come at any speed, since unit is entirely automatic and completely independent of the conveyor line. If the packages are in excess of the predetermined operating speed of the machine, an accumulator roller, through its switches, will hold back any excess. And if the operator forgets to load empty pallets into the machine, delivery is automatically stopped.

Machine is so designed that by use of a stack-pattern electrical control unit, selection of up to 18 stacking arrangements can be obtained by the push of a button. The machine can, with this electrical panel cabinet, handle a majority of the standard types of cases. Sales, service and engineering application of the newly developed machine are handled exclusive by Lamson Corp. of Syracuse.

Code Machine 2

A CODE or contents-marking machine that automatically imprints impressed labels on bare surfaces of bottles, tins, canisters and cartons as they travel on a labeler, or other production machine, is announced by Adolph Gottscho, Inc., Dept. I, New York City. New unit, which is called Autoboder, is designed to reduce both the labor cost involved in hand-stamping and the elements of error and waste involved in pre-printing labels. Maker states that a sharp, clean impression of any combination of letters or figures up to 1 in. in length is produced on either flat or curved surfaces. This mark can be located accurately at any predetermined place on the container, horizontally or vertically.

Completely self-contained and occupying a space of 6 in. by 9 in., unit is controlled at any point on a labeler or other production machine where the objects to be marked are held firmly during their straight line travel. It is integrated with the movement of the holders or pushers on the line, which trip a star wheel and rotate the marking drum to which it is geared.

Shipping Containers 3

MADE of a tough, thermoplastic material and insulated with lightweight plastic foam, new shipping containers have been jointly developed by the United States Rubber Co. and R. H. Bishop Co. The containers are now being produced by the latter company in their plant at Champaign, Ill.

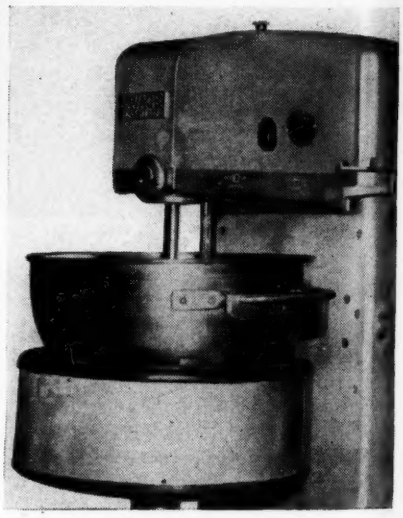
Bottom, sides, lid, inner container, and all internal bracing in these food shippers are constructed of the rubber company's product, Versatile, which is non-corrosive, has very low heat conductivity, is extremely light in weight, and features high impact strength.

All connections and seams in the containers are plastic welded to assure a strong, permanent, pressure-tight bond, which also curbs vapor transfer into the insulation space. Flotofoam plastic foam used in insulation weighs less than 1 lb. per cu. ft.

Cladmetal Equipment 4

COMMERCIAL USE in a marketed processing unit of a cladmetal—specifically, Rosslyn Metal, made by bonding stainless steel and copper—is announced by Savage Bros. Co., Dept. I, Chicago. The unit is a kettle, designed essentially for candy making, where continuous stirring while cooking is required.

The kettle features a permanent bond



of copper sandwiched between layers of stainless steel. Quick and even distribution of heat is afforded by the highly conductive copper, while the stainless steel surfaces are advantageous in hardness for long wear, corrosion-resistance, and ease of cleaning, all important qualities in the sanitary production of candies and foods. Employed in their pure state, the metals are bonded by the Kinney Process, owned by the American Cladmetals Co. No soldering, plating, or adhesives are used to make the bond.

Kettle illustrated is 20-gal. unit, 24 in. in dia. and 12½ in. in depth, weighing 15 lb. Other kettles having 5, 7, 10, 15 and 30-gal. capacity are planned.

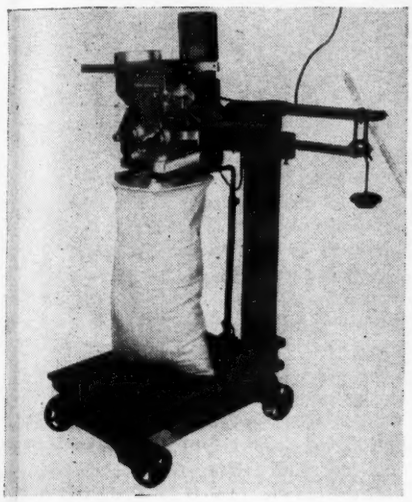
Sanitary Hose 5

AVAILABLE again in a white, oil-resisting synthetic cover, sanitary hose made by the Goodyear Tire & Rubber Co., Dept. I, Akron, Ohio, is flexible and kink-resistant product recommended for general washing and cleaning service in packing plants, creameries, dairies, canneries, and food processing plants. Designed for heavy-

duty operations, hose is manufactured in 25 and 50-ft. lengths. A special creamery hose, in black cover, is available in continuous lengths up to 450 ft.

Bagging Machine 6

A NEW automatic electric bagging machine which, when used with a standard platform or dial scale and a bag holder, forms an automatic bagging scale unit, is announced by Burrows Equipment Co., Dept. I, Evanston, Ill. It can be used for filling all sizes of bags with any free-flowing, non-abrasive material which does not require vibrating.



Operator sets the scale beam for the desired weight, places the bag in the bag holder, then opens the valve manually by turning a lever. From then on, process is automatic. When the bag is filled, unit shuts off automatically and weight is accurate within 1 oz.

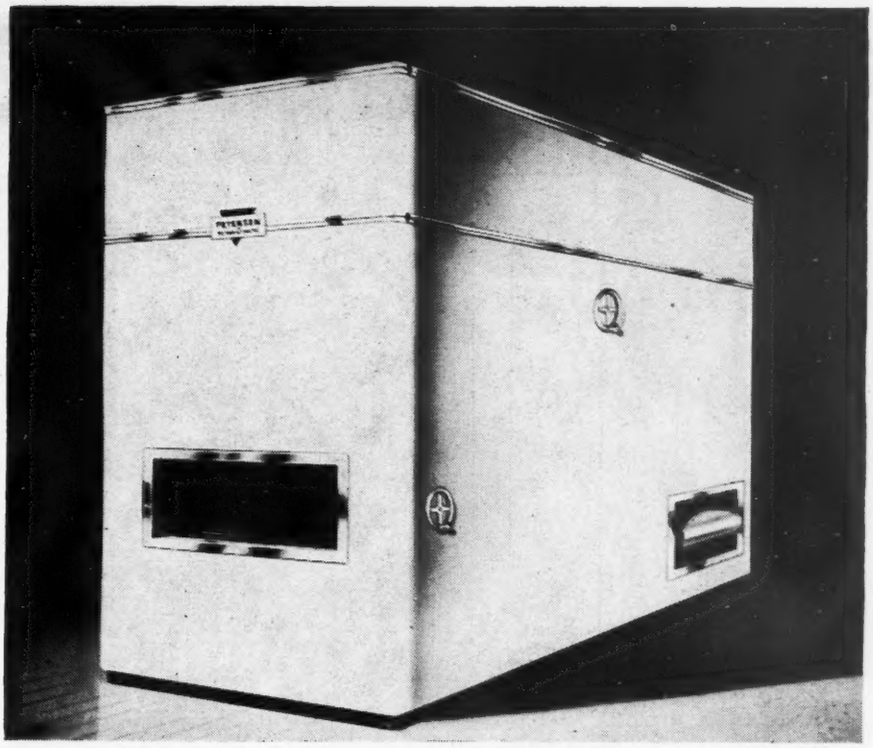
This machine is already being used for bagging hybrid corn at the rate of 7 bushel-bags per min. on treated corn and 9 bushel-bags per min. on untreated corn. Oats can be bagged at rate of 500 bushels per hr. in 3-bushel bags.

An optional feature is a unit which will automatically obtain samples from each bag. An adjustment slide regulates the sample from 0 to approximately 2 oz.

Germicidal Control 7

RECENT DEVELOPMENTS in germicidal equipment are the No. 2902 and 2903 "Letherays," announced by Hanovia Chemical & Mfg. Co., Dept. I, Newark, N. J. Chief purpose of these ultraviolet units is to protect merchandise from spoilage caused by air-borne bacteria and mold spores. Application is suitable for drugs, foods, beverages, meats, and many other products susceptible to contamination.

The new units, designed for mounting on ceilings or over processing tables and conveyors, are effective in direct irradiation of products or of the surrounding air. They are equipped with adjustable louvres which can be set to direct or baffle the germicidal rays as desired. Equipment is also applicable for protection of personnel in factory and office from respiratory ills.



Automatic, Mechanical Bread Depanning 8

HAND-DUMPING of bread from pans can now be eliminated with a new mechanical bread depanner announced by The Petersen Oven Co., Dept. I, Franklin Park, Ill. In this machine, which occupies a floor space of 4x11 ft., conveyors feed in strapped sets of baked bread in pans. Depanned bread is discharged, at conveyor height, at the side near the rear. Empty pans issue from the back of the machine onto another conveyor.

The unit is finished in white brush enamel sheets, with stainless steel trim. Lift-out sections are provided for easy access to the mechanism. Operation is at a speed of 1500 pan straps an hr., and only two adjustments are necessary. One hand wheel adjusts guide rails to any strapped-pan overall length up to 30 in., and of any conventional pan size. The other hand wheel adjusts spacers or spreaders between pans.

With a suitable conveyor system, the unit makes possible automatic, continuous bread production. It is applicable to any bakery with a reasonable production volume of pan bread. Machine is driven by a single ¾ hp. motor with reduction gears and pressure lubricated, low-speed bearings.

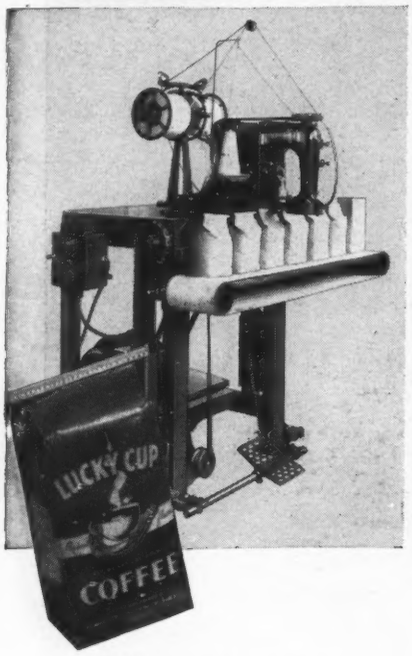
Wire Conveyor Belt 9

TO PERMIT continuous movement of work through industrial washing, drying, treating or cooling machines using low or high temperature processes, a woven wire conveyor belt has been produced by the Cambridge Wire Cloth Co., Dept. I, Cambridge, Md. New design of the belt combines maximum belt strength with maximum open area. Mesh size can be controlled in the manufacturing process to provide up to 87 percent open area, while the coiled construction utilizes the maximum strength of the metal from which the belt is made. These large openings are extremely useful in industrial washing machines, since wash water or spray can be directed from above or below the belt, to pass freely over the work, draining readily back into the wash tank. Belt can be manufactured, from any metal or alloy, to a wide variety of meshes.

WRITE FOR MORE INFORMATION

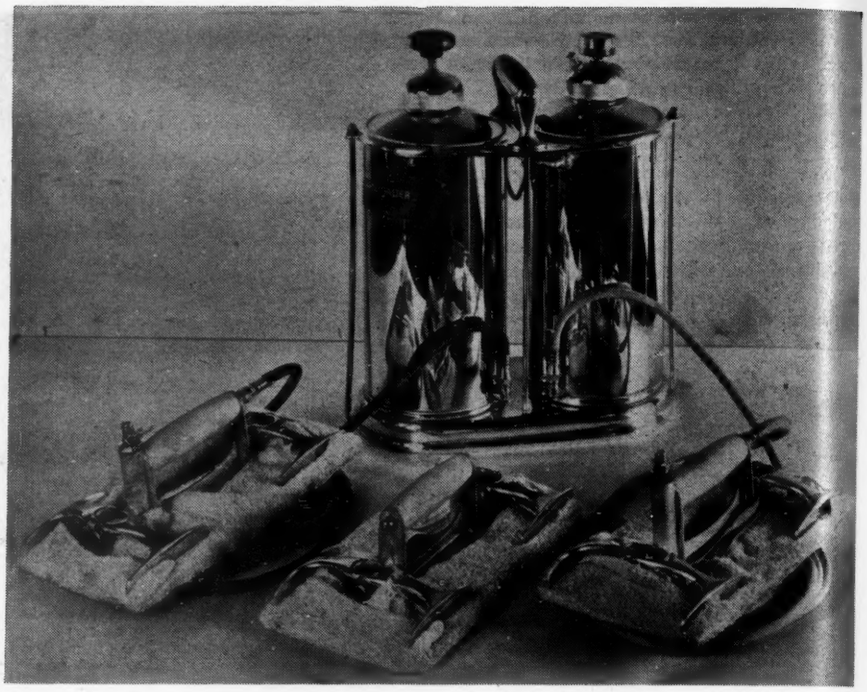
Food Industries Reader Service now makes it easy for you to follow up the news on new equipment and new materials. Tear-out coupon cards are supplied for your convenience on the special colored page which follows the equipment news section in this month's issue. Enter your requests, fill out and mail cards, and let Reader Service do the rest.

for closing
PAPER BAGS



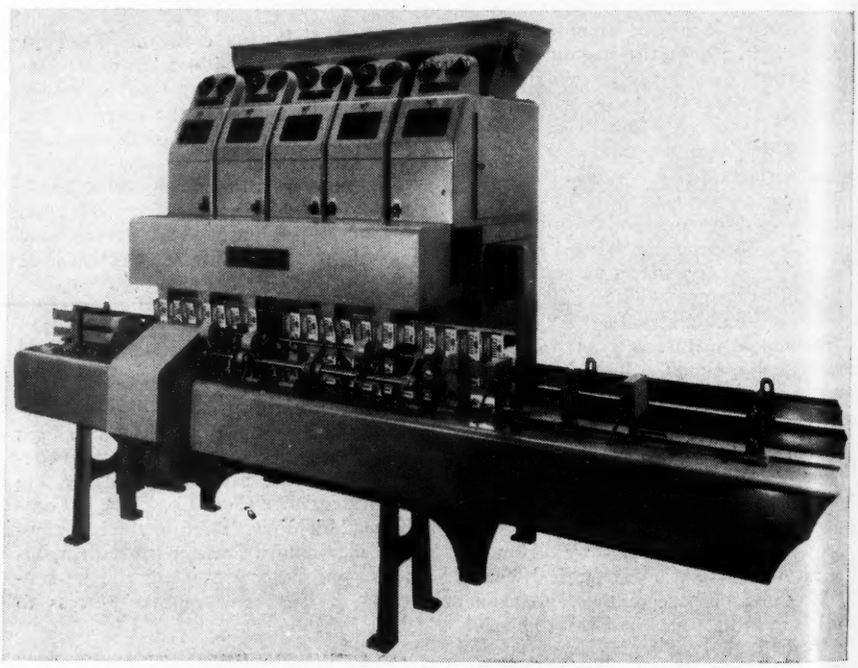
Where food products are packaged in paper bags—from 1 lb. to 25 lb. size—the closure should be firm, tight, eye-appealing, inexpensive and easy to open. The ideal closure is the Union Special *"Dubl-Tape"* Closure. Producing this closure is the final step in mechanized packaging and can best be done with the Union Special 60000 D sewing head. Mounted on the popular Style 21800 N portable, table-type, bag closing machine, this is considered *essential equipment* by many producers of dry foods. Style 21800 N machine includes a power-driven conveyor adjustable vertically to accommodate different sizes of bags. Control is by floor treadle and the unit may be operated from a sitting position. Ask for recommendations on your particular problems. Literature on request. UNION SPECIAL MACHINE CO., 450 N. Franklin St., Chicago, Ill.

Union Special
Bag Closing Machines



Mechanical Wall-Washing Equipment 10

DESIGNED to wash, rinse and dry all types of interior wall surfaces, restoring the original lustre, a machine is now marketed by Quaker Maintenance Co., Inc., Dept. I, New York City. Special cleaner and rinse water are applied to all surfaces with large, lightweight trowels, covered with terrycloth pads. Cleaner and rinse are fed into the trowels by finger tip control from pressure tanks.



Automatic Weighing and Filling Machine 11

FOR the packaging of short-cut macaroni, a new automatic weighing and filling machine has been developed by the Triangle Package Machinery Co., Dept. I, Chicago. The unit consists of five high-speed scales, equipped with patented vibratory feeder trays. Machine automatically receives five cartons at a time, and registers them beneath five separate filling spouts. Fill material is vibrated and dispensed into weigh-by buckets, which are then power-rotated to dispense their loads through the series of spouts into the cartons. The machine functions at the production rate of 60 accurately filled 1-lb. cartons per min.

A feature of machine is that if carton supply runs short, filler automatically holds back dispensing its load, thus preventing any spillage. As soon as proper number of cartons are fed in, machine starts automatically.

Coney Island 1890

Packages get out of date, too

Is your package smart and up to date? Is it styled to give your product 1948 sales appeal? And does it give good protection?

We'd like to show you what Patapar Vegetable Parchment can do for you. We'd like to show you how Patapar can be exquisitely printed with bright colors and appealing designs in the modern manner. We do the printing in our own plants, which are specially equipped for printing Patapar economically by letterpress or offset lithography, in one or more colors. Our art department will help you create a new wrapper design, with new life and sparkle.

Protection. With Patapar you get a wrapper that really will protect your product. Patapar has high wet-strength. It resists grease. It is pure of texture.

Make a note now to get in touch with Patapar.

Keymark

When you order printed Patapar you get the extra advantage of the Patapar Keymark. No extra cost. This nationally advertised symbol on your Patapar wrappers will remind people that your product is well protected.

Patapar REG. U. S. PAT. OFF.

Ideal for:

Butter wrappers	Deep freeze wraps
Ham boiler liners	Fish wrappers
Milk can gaskets	Cheese wrappers
Can liners	Vegetable wraps
Pie doilies	Sliced bacon wrappers

and hundreds of other uses

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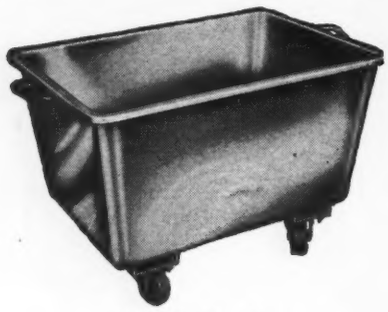
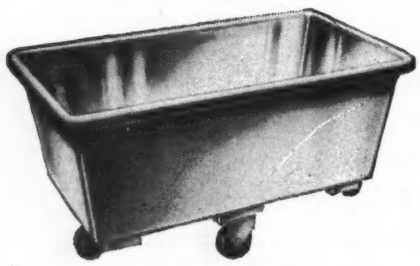
EQUIPMENT

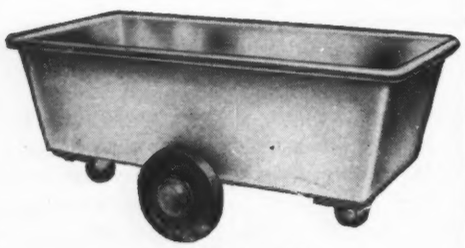
STANcase STAINLESS STEEL *FOOD HANDLING* TRUCKS are highly recommended to *buyers of quality* who understand the *economy of quality.* These trucks are models of *sanitary equipment,* ruggedly constructed for life-time wear. Inside surfaces are highly polished and seamless. Carefully engineered to provide generously rounded corners and smooth-rolled rims. Manufactured to highest *quality specifications.* Maintained sparklingly clean with minimum labor.



MODEL No. 9
Capacity—225 lbs. Weight—36 lbs.
Ruggedly constructed of 18 gauge Stainless Steel.
Inside Dimensions: 28" long; 19" wide; 14" deep.



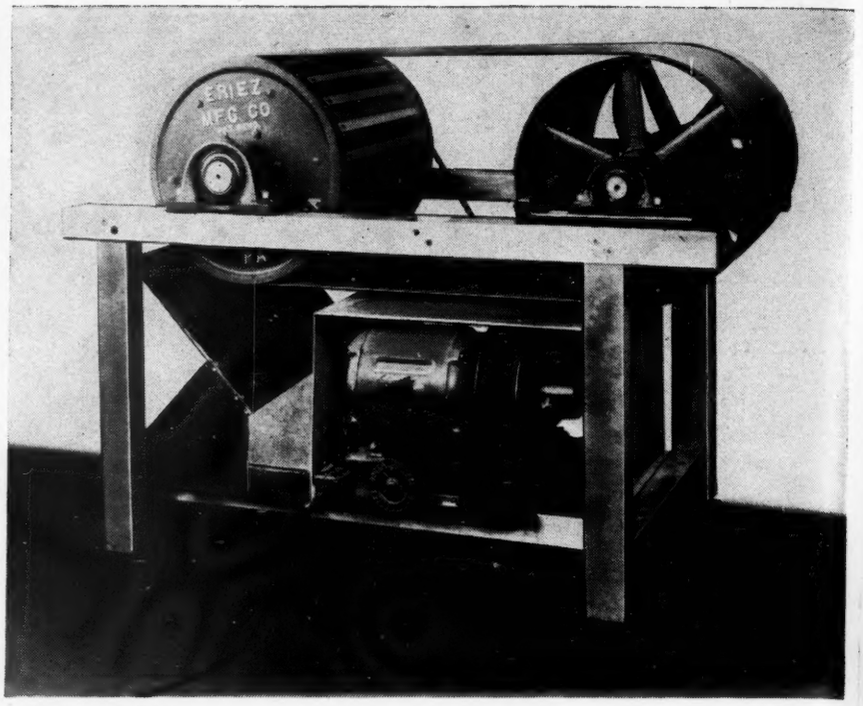
MODEL No. 18
Capacity—500 lbs. Weight—100 lbs.
Ruggedly constructed of 14 gauge Stainless Steel.
Inside Dimensions: 43½" long; 22¼" wide; 16" deep.



MODEL No. 36
Capacity—800 lbs. Weight—195 lbs.
Ruggedly constructed of 14 gauge Stainless Steel.
Inside Dimensions: 57" long; 24½" wide; 17" deep.

WRITE FOR BULLETIN S-47

THE STANDARD CASING CO., INC.
121 Spring St. New York, 12, N. Y.



Non-Electric Magnetic Head Pulley 12

DESIGNED for use as a head pulley in belt conveying systems, Puri-Pulley, a new type magnetic unit, is now being produced by the Eriez Mfg. Co., Dept. I, Erie, Pa. It is non-electric and was developed solely to remove fine iron or less magnetic particles and afford automatic separation of ferrous from non-ferrous material ranging in size from 10 to 200 mesh.

While present magnetic pulleys are built to cast a magnetic field several inches (for removal of ordinary tramp iron), the new pulley's strength is concentrated close to the face plate. At 1 in. from its surface, the magnetic field is approximately three times as strong as a standard pulley.

The effective cleaning surface has been increased substantially by narrowing the air-gaps and increasing the number of pole plates. This provides more major areas of magnetic concentration. The unit is available in 18 and 24 in. dia. and in belt widths ranging from 12 to 60 in.

Dust Filter 13

DEVELOPED for food processing industries, a new automatic and continuously operating autoclean dust filter is being offered by the Day Co., Dept. I, Minneapolis, Minn. It is designed for a more efficient self-cleaning through the use of slow traveling "blow-back" rings for continuous cleaning with high pressure air blown through the tubes in a reverse direction. This positive-air-cushion cleaning permits use of a higher grade, more efficient filtering cloth. Maximum cloth area loss is stated to be only 1¼ percent even when cleaning. No shutdown of any portion of the filter is necessary for cleaning or rapping, since cleaning mechanism operates continuously, thus assuring constant back pressure and air volume. Of compact design, unit contains no dust-catching ledges for contamination or infestation, requires little floor space, and costs of installation are termed low. Filters are furnished in multiples of four tubes, assuring wide capacity range to fit all requirements.

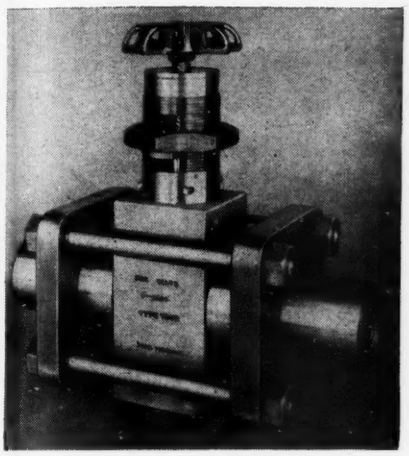
Blow-Down Valve 14

BASED on the venturi ball valve principle, a new continuous blow-down valve is offered by the Paul Valve Corp., Dept. I, New York City. It is intended to improve flow characteristics and resistance to erosion.

With only two moving parts and no springs, the valve utilizes the Bernoulli Theorem to force a precision ball into the low pressure center of the stream, and hence into the seat. Body of the unit is machined to the shape of a venturi tube.

The valve acts to close automatically whenever water or steam flows through the venturi. To open, the stem and yoke push the ball down, rolling it out of the seat and down into a recess. The yoke is shaped like an inverted "U" straddling the stream, so that when the valve is open there is no restriction to the straight-line flow.

This valve is of the outside screw and yoke type so that the stem threads are not exposed to excessive heat and reaction of the fluid. Retainers with the inlet and outlet connections are held by outside

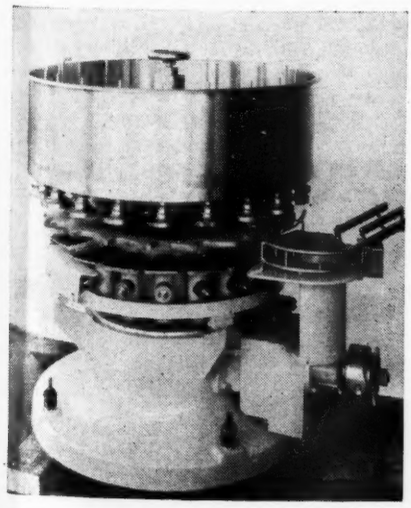


bolts; thus, without breaking the pipe connections, the valve may be opened to inspect, renew or repair interior parts.

The 1500-lb. series valves are available in sizes from ¼ to 1 in., conforming with inside dimensions of Schedule 80 pipe. Screwed ends are standard; socket or butt welding ends are optional.

Filling Machine 15

New unit, designed for filling operations, is termed capable of handling almost every type of canned or bottled products, from citrus juices to baby foods. Features are specially designed foamless valve and a



cone-type, self-cleaning bowl. It is reported machine can attain filling speeds as high as 350 cans or bottles per min., with intake adjustable for specific requirements. Unit is available in 12, 20 or 32 stations. Maker is Central Machine Works, Inc., Dept. I, Philadelphia.

Roccal's superiority over old-fashioned germicides has been demonstrated time after time. In painstaking and exhaustive laboratory tests Roccal was found to be a much more powerful germ killer yet infinitely safer to use than the germicides now in general use.

Roccal *kills bacteria.* It inhibits the growth of molds, slimes and algae. Yet, in proper dilutions, it is non-poisonous, virtually odorless and tasteless. It will not rust equipment, will not harm fabrics. It does not irritate the skin.

Accepted by many leading health authorities, Roccal is the sanitizing agent of tomorrow—ready for your use today.

Sample and Literature on Request

Special Markets - Industrial Division

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No more laborious and messy hand-spraying . . . no more costly waste of materials . . . no more halfway results . . . no more insects!

Use this unique, scientific method of getting rid of insects . . . the Lethalaire method. A twist of the wrist releases a circulating mist that turns air into a death trap for insects. No need to spray behind objects, in corners or under baseboards. The precision-engineered nozzle makes certain every nook and cranny will be hit . . . releases the exact amount of insecticide needed to do a job. Lethalaire kills insects, from cockroaches to silverfish, does not contaminate food.

Lethalize with Lethalaire. See your supplier today . . . or mail the coupon for further interesting information.

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Please tell me more about the Lethalaire method of controlling insects.

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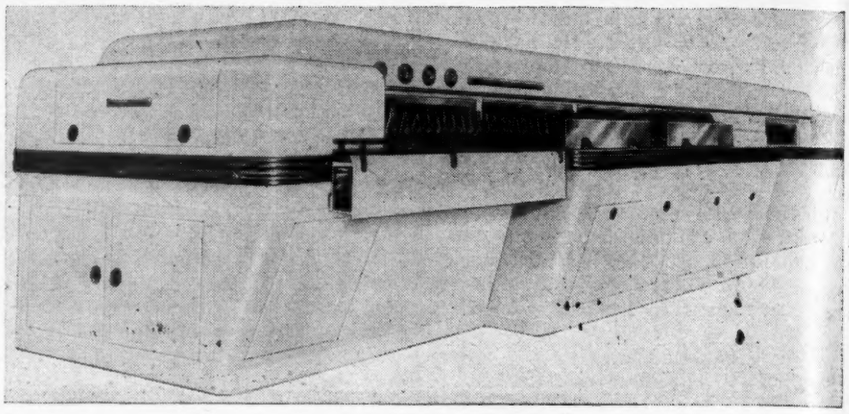
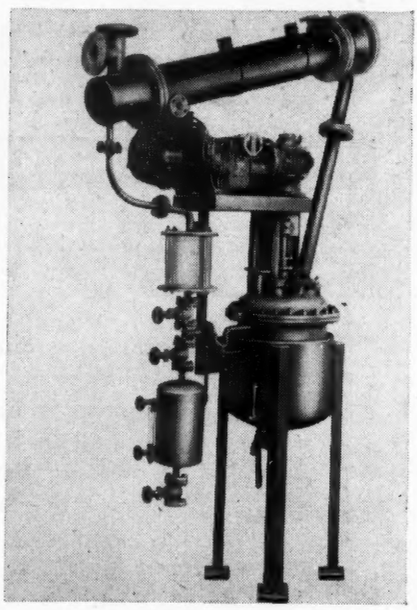


Smaller Size Crown-Finish Bottle Washer 16

DEVELOPMENT of a new machine stated to wash bottles better in one-third less space is announced by Miller Hydro Co., Dept. I, Bainbridge, Ga. A more efficient arrangement of fountain wheels and strainers makes possible a smaller size—an advantage where space is limited. Optional on the washer is a new automatic loader. Bottles are placed either individually, or a case at a time, on a wide, moving belt. They are then carried onto the cup chain in washing position. Loader handles bottles from 6 to 12 oz. without any adjustment. All pumps and motors are concentrated in an easily accessible compartment. Built in three sizes, with capacities from 60 to 250 bottles per min., unit will accommodate any size crown-finish bottle from 6 to 32 oz. Cups of chain prevent bottles rolling.



Pilot Plant Equipment 17

FOR HANDLING liquid and semi-liquid compounds on a pilot plant scale, this special stainless steel unit has been built by L. O. Koven & Bros., Inc., Dept. I, Jersey City, N. J. Equipment is designed for full vacuum operation throughout.

A steam or hot water jacket, surrounding the stainless steel kettle, is heated by steam at 125 psi., or by hot water at 250 psi. The motor-driven agitating mechanism can be adjusted by means of a master speed control to give a speed-range ratio of 6 to 1. Agitation is accomplished by means of a U-shaped paddle which simultaneously stirs and removes the material from the sides and bottom of the kettle. This constant stirring and scraping of the material from the sides and bottom of the kettle assures uniform, rapid heating and mixing, at the same time prevents caking of the mixture.

A vacuum-type cover, bolted to the top of the kettle, is provided with two sight glasses, thermometer well, and a large hinged, swing-bolted handhole.

The vapor passes up through the vapor pipe into the condenser head. The condenser is of welded stainless steel. Vacuum condensate tubes are completely surrounded by the cooling medium in the condenser jacket. The condensate passes, by gravity, through the condenser exit head, and through the inspection sight glass into the vacuum receiver, or it is returned to the kettle for further treatment. The contents of the kettle are easily and quickly removed by means of the large 7-in. valve located in the kettle bottom.

This pilot plant is adaptable to widely diversified usage for extraction, purification, evaporation, and mixing in the food, chemical, soap, petroleum, plastic, and pharmaceutical processes.

Monel Covered Motor 18

FOR GENERAL APPLICATION in the food and chemical industries, a corrosion-resisting a.c. motor has been developed by The Reliance Electric & Engineering Co., Dept. I, Cleveland. Built to standards set by the Underwriters Laboratories for operation in Class I-Group D (locations where hazardous conditions exist), the new motor has also been made explosion proof.

Monel metal has replaced steel in the motor's outer cover (photo, next page, illustrates high finish), fan cover, and construction of the lead outlet where the usual steel channel has been replaced as a lead inclosure with a Monel pipe nipple

full-flavor tone

Our original laboratory research has produced a new and outstanding imitation raspberry flavor. It is of highest concentration and adapted for general purpose work. Samples on request.

Our flavor catalogue is now available.

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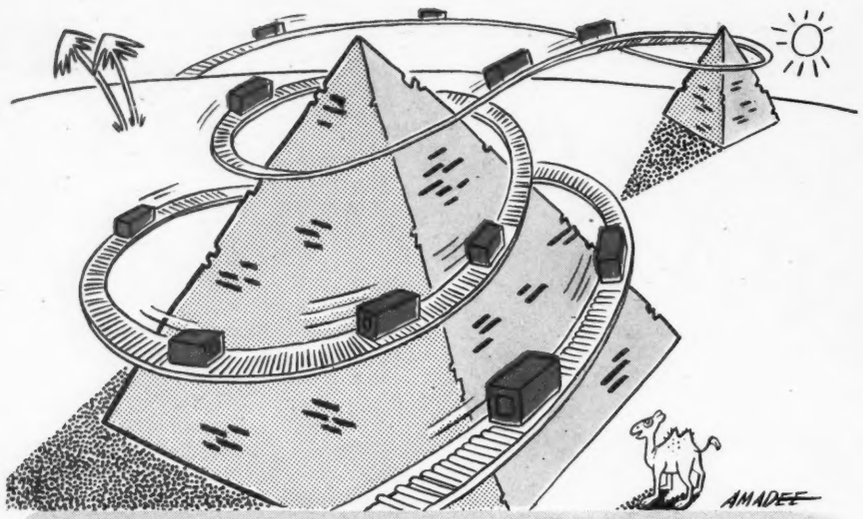


TOUGH ASSIGNMENTS

are ALVEY'S specialty...

an *"EXTRA"* that comes with

ALVEYORS*

the word for every conveyor need

"We've got to cut handling costs" exclaimed the company President"... and that means a tremendous increase in volume handled. Our plant is on three floors and our products are packed in everything from big crates to small bottles. The problem has about got us licked!"

That problem, with about a thousand variations of course, is met by Alvey experts every day... met successfully, too! Because wide experience in diversified industry has enabled Alvey-St. Louis to specialize in "tough-nut" problems for more than a generation. Alvey can "think through" on difficult assignments because Alvey specialists have "lived through" similar problems throughout industry.

**Trademark*

that goes into the inner inclosing shell.

Cast bronze replaces cast aluminum in the fan, and extra grease-and-bearing protection has been given the motor by the addition of bronze shaft collars. Brass has replaced steel in the grease pipes and in the screws which retain the fan cover. Bolts holding the outer fan, being in a partially protected location and readily replaceable, have been made of cadmium-plated steel.

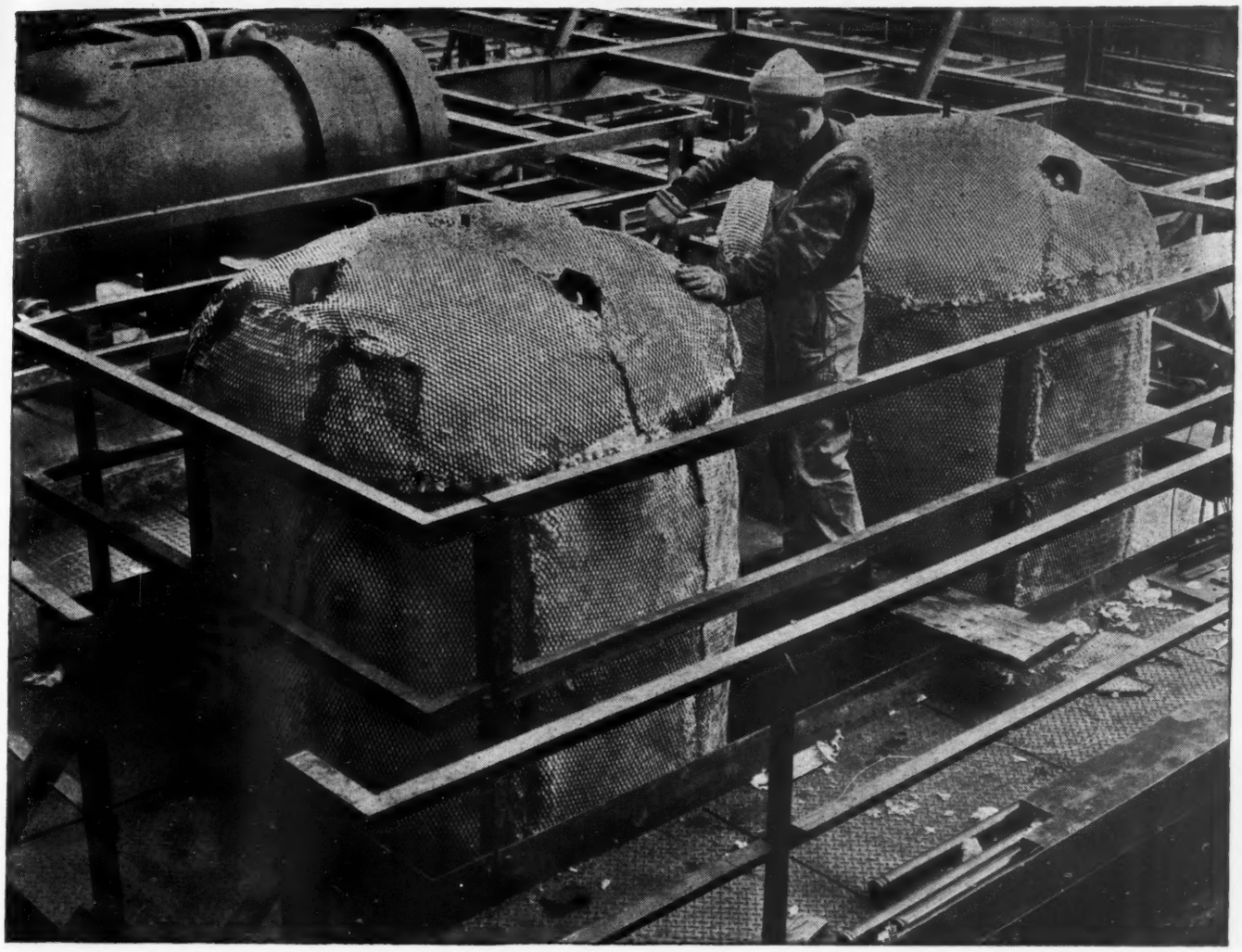
Packaging Machine 19

LOCK-TYPE trays and cartons are formed automatically from flat, unglued blanks in the "Tray-Lock," a new machine announced by General Mills, Inc., Dept. I, Minneapolis, Minn. The container thus produced, plus an overwrap of transparent material, is widely used for bakery prod-

ucts, frozen meats and fish, fruits and vegetables, candies, and other products. Speeds of up to 90 containers per min. are possible with the machine. The unit requires 3 sq. ft. of floor space. It is mounted on locking casters. Included is a 100-200 v., 60 cycle, single-phase, ½ hp. motor with variable speed unit.

Stainless Steel Pump 20

A NEW LINE of sanitary stainless steel pumps is being marketed by the Waterous Co., Dept. I, St. Paul, Minn. Omitting all internal threads, these sanitary pumps are



FIBERGLAS*

. . . form-fitting fuel-saver

Efficient Fiberglas Metal Mesh Blankets are money-savers right from the start. They're extremely easy to apply—even on the most irregular and complex surfaces. And regardless of the application—boiler, retort, oven or tank—these insulating blankets can be depended upon to do an outstanding job of saving heat and keeping fuel costs down.

The high thermal insulating efficiency of Fiberglas results from the countless tiny air spaces enclosed in a lightweight, wool-like blanket of long, fine fibers of glass—a material that will not burn, rot or decay. It's non-corrosive; will not corrode metals. Fiberglas insulation holds together, is resilient, does not settle under vibration.

This basic material is further processed into blankets that meet all industrial requirements for insulating hot surfaces—up to 1000°F. When fabricated with a metal mesh exterior, the surface not only facilitates application but also provides a base for insulating and finishing cements.

If you want the *best* in efficient, economical, easy to apply insulation, get all the facts on Fiberglas blankets —their many forms and uses. Write for "Fiberglas Insulations for Industry", Owens-Corning Fiberglas Corporation, Dept. 2009, Toledo 1, Ohio. Branches in principal cities.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

OWENS-CORNING
FIBERGLAS
THERMAL INSULATING MATERIALS

*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) for a variety of products made of or with glass fibers by Owens-Corning Fiberglas Corporation.

Specialized engineering and precision construction have only one purpose here . . . to give you exact control of spray pattern, distribution, and atomization . . . as well as impact where required, for any given liquid volume and pressure. For your requirements, you will find that Spraying Systems Spray Nozzles can always give you more in performance . . . to improve operations and lower cost. Catalog 22 gives you all the facts.

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Engineers and Manufacturers

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WRITE FOR CATALOG 22

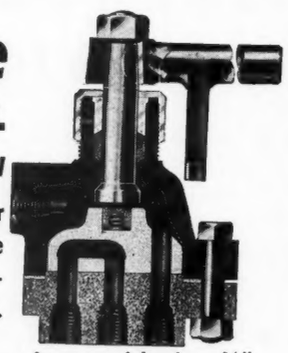
NICHOLSON *FAST-ACTING* 2-WAY VALVES

Save Muscle

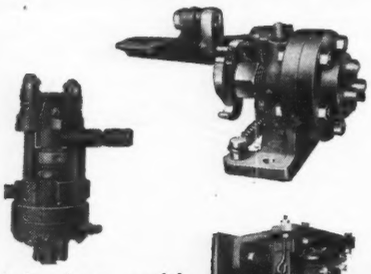
IMPROVE PRESSURE CONTROL

On or Off Instantly with 60° Lever Travel

Widely used as replacements for gate or globe valves, these fast Nicholson units save time and labor, and minimize the differential between opening and closing pressures.



Lever model: sizes ¼" to 2½"; press. to 500 lbs.



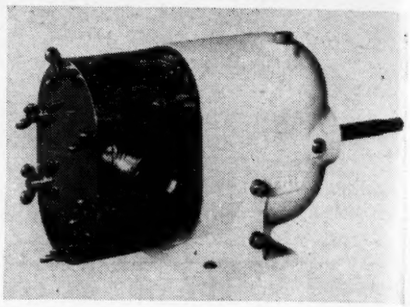
Left, lever model: sizes ½" to 2½"; press. to 5,000 lbs. Right, foot and solenoid models: sizes ¼" to 2½"; press. to 375 lbs.

METALS for ALL MEDIUMS

Choice of 6 metal combinations for the corrosion problems of all mediums: air, gas, steam, water, tar, oil, etc. Featuring special seats that don't cut out; easily repacked stuffing box; heavy bodies. Also a full line of 3 and 4-way cylinder control valves; and special multiport, distributing and proportioning valves. CATALOG 546.

W. H. NICHOLSON & CO.

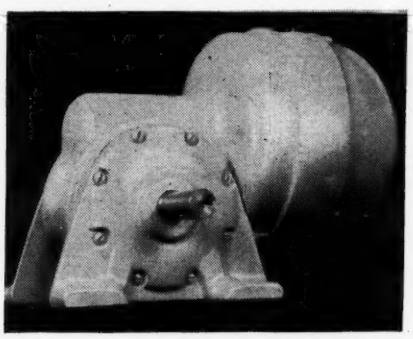
193 Oregon St., Wilkes-Barre, Pa.



of rigid ball bearing construction. Positive tolerance control is a feature. Pumps can quickly be disassembled for cleaning, since there is a minimum of removable parts.

Gear Motor 21

A NEW lightweight, compact fractional-hp. motor, with right-angle single-reduction worm gear type speed reducer, and with gear housing and motor frame in one piece, is announced by Electra Motors, Inc., Dept. I, Annheim, Cal. It is manufactured in two models—foot mounted (Series 400), and ring mounted (series



500)—for three-, two-, and single-phase a.c. operation in ¼, ⅓, ½ and ¾ hp. sizes. All are of the general-purpose, continuous-duty type, with ball and tapered roller bearings. Important feature of design is that motor can be assembled in any one of the four positions, and the entire unit can be operated at nearly any desired angle. In ring-mounted model, positive seal prevents gear oil from leaking into mixing chambers or other equipment, thus prevents contamination.

Threading Machine 22

AN ELECTRICALLY powered pipe and bolt threader, designated "Tom Thumb" No. 582, is announced by The Oster Mfg. Co., Dept. I, Cleveland. Ranges: Standard, ¼ to 2 in. pipe; extra, ⅛ in. pipe; with special drive shaft, 2½ to 8 in. pipe; and bolt range, ¼ to 1½ in. pipe. Nipples as short as 3½ in. in the 2 in. size can be threaded on both ends without using a nipple chuck (other sizes in proportion); and pipe or studs as short as 2½ in. can be threaded on one end. Regular equipment consists of complete machine for bench use. A steel stand, equipped with 16 in. wheels, is furnished as an extra when frequent portability is desired. Motor is universal, reversible, variable speed for 110v., either a.c. single-phase, or d.c. Drive from motors is by V-belt.

CATALOGS, BULLETINS

This digest of manufacturers new publications is offered by FOOD INDUSTRIES Reader Service as a convenience for executives. The editors feature catalogs, data sheets and technical pamphlets likely to interest purchasing agents, superintendents, packaging men and food technologists.

Food Plant Equipment

Speed Control 51

B. F. Goodrich Co.—4-page leaflet gives details on speed selector which permits stepless, infinite ratio changes in rapid succession by a new development in planetary motion. Utilizing two V-belts and four variable pitch sheaves, unit is stated to provide any speed change from from 0 to 800 rpm at constant torque. A slight change in the sheaves results in a large shift in output speed through medium of the planetary. Bulletin describes principles of operation and pictures some of most recent applications of device. Number of machines on which it can be utilized are listed. Data tables for ½, 1, and 2 hp. models are included.

A. C. Motors..... 52

Electric Machinery Mfg. Co.—Latest edition of company publication, "E-M Synchronizer" (No. 24) contains special feature articles of interest in food industries. Among subjects covered: How motors help produce and preserve food, coil insulation for large a.c. motors, new materials and methods, refrigeration factors, and motor requirements for high inertia loads.

Corrosion Resistant Plug Valve..... 53

Ampco Metal, Inc.—4-page Bulletin 91, covers design features of company's plug valves for control of many corrosive liquids. Valves are aluminum-bronze throughout. Bulletin is illustrated and includes engineering drawings showing various sizes.

Automatic Cooler 54

J. W. Greer Co.—12-page Bulletin 46-5 covers automatic multitier cooler. Construction and operating features are described in detail, with accompanying engineering drawings and pictures. Typical installations are diagrammed, showing lineal feet of cooling travel, also floor space required.

Automatic Tray Feeder..... 55

Currie Manufacturing Co.—Illustrated fold-out describes company's automatic feeder for metal and wood starch trays. Unit is adjustable to fit the majority of trays now commonly used.

Double Roller Mill..... 56

The Wolf Co.—12-page Bulletin R85 covers a new series of double roller mills for processing wheat into flour. It describes construction, mechanical and operating features of mill in detail, with perspective and cutway drawings fully illustrating machine. Tables give dimensions, weights and types of drivers.

Mixing Units 57

Mixers, Inc.—Pocket-size illustrated pamphlet concerns company's jacketed, temperature-controlled and vacuum-operated mixers. Recommended uses for various types of mixers and materials handled are given.

Alloyed Stainless Steel..... 58

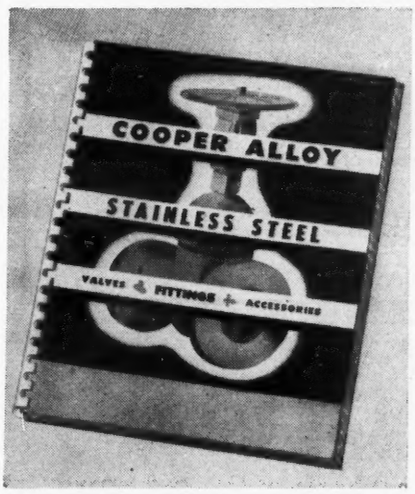
The Duriron Co., Inc.—8-page Bulletin 112 covers high-alloy low-carbon austenitic stainless steel known as Durimet 20. Chemical composition and mechanical and physical properties of metal are given. Table lists its corrosive resistance to about 125 solutions.

Evaporative Condensers 59

Vilter Manufacturing Co.—8-page bulletin on evaporative condensers is fully illustrated with photos of actual installations and important construction features. Included are descriptions and diagrams of the operation and recommended applications of units. A page of specifications gives dimensions and engineering data.

Stainless Steel Valves..... 60

The Cooper Alloy Foundry Co.—80-page Catalog 51D gives complete information on company's line of corrosion resisting stainless steel valves, fittings and accessories. Tab-indexing system enables user to obtain information quickly. It includes gate, globe, angle "Y", and



tank, check and needle valves. Engineering drawings cover each type, with dimensions given in table form. Also shown are accessories, gages, cocks and strainers, with dimensional drawings of flanged fittings. Analyses, characteristics and recommended applications for various alloys are included, along with finished weights and prices.

Tableting Machines 61

The F. J. Stokes Machine Co.—Catalog 48-T describes company's complete line of standard, special and auxiliary tableting machinery and equipment. Offering a fund of key information for manufacturers interested in forming industrial products by the compression method, the profusely illustrated book shows a wide range of molds and materials that can be handled by company's machines, and typical installations are depicted.

Flaking Mills 62

Allis-Chalmers 16-page bulletin covers modernized line of heavy duty flaking mills. Explanations are provided (1) as to why heavy duty mills reduce flaking costs, (2) importance of flaking mills in cereal production, (3) features which cut maintenance costs, and (4) how flaking rolls are made. New gelatinizing rolls or double drum drivers are finding many applications in drying and flaking high moisture content products in food and chemical industries. Varied uses of flaking mills—in production of rolled oats, flaking oat groats, preparing flakes for continuous solvent extraction of soybeans and cottonseed oils—are touched upon, and a typical arrangement of cereal equipment in a four-roll flaking plant is diagrammed.

Water Coolers and Filters..... 63

Filtrine Mfg. Co.—4-page bulletin gives details on low temperature storage type water coolers. Illustrations of equipment are shown. Dimensions and capacities are tabulated. Also included are data on filters and rectifiers.

Food Equipment and Materials..... 64

Seedburo Equipment Co.—144-page catalog covers complete list of all equipment and materials handled by company. All merchandise is described and illustrated. Departmental index on front cover enables user to find desired section readily. Approved grain and seed testing equipment and procedures are detailed. Prices are listed.

Dough-Forming Equipment 65

J. W. Greer Co.—3-page illustrated folder No. 44-1 treats of dough forming equipment for band ovens. A cutting, sheeting and portable bar machine is described, and shown are various layouts for different products. Contruction and operating features are detailed.

Container Drier 66

Barry-Wehmiller Machinery Co. — 2-page Bulletin 91 contains floor plan installations and describes an automatic self-operating machine designed for drying various sized containers. Equipment and types of containers handled are illustrated.

Direct-Fired Unit Heater..... 67

The Thermobloc Div., Prat-Daniel Corp.—8-page Bulletin 300 contains information on company's automatic, direct oil or gas fired unit heater. It delivers 550,000 Btu. per hr. of draftless heated air to working level at a reported efficiency of from 82—86 percent burning #3 oil, or lighter, or gas. Unit occupies a floor space of 30-in. dia. It is shipped completely assembled.

Laboratory Grinding Mill..... 68

Pulverizing Machinery Co.—Bulletin concerns company's mill for pulverizing analytical samples of materials and mixtures up to 7 percent of free moisture. Features are described in detail in text and illustration. Laboratory unit is available in bench and floor models.

Motors and Controls..... 69

Allis Chalmers—12-page Bulletin 51B6052J provides detailed specifications covering squirrel-cage induction motors and application data, also range of sizes and speed torque curves on synchronous, wound rotor, and d.c. motors. It also covers applications and features of gearmotors . . . multispeed induction motors, and there is an

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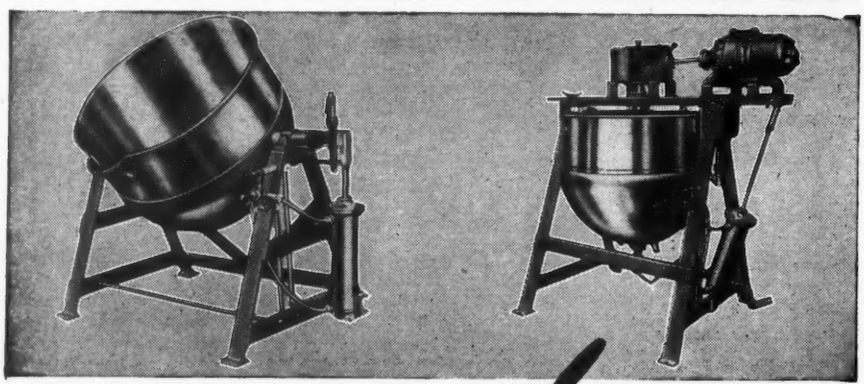

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induction motor selection chart for units from 1 to 200 hp. Bulletin includes company's complete line of motor controls for every requirement of motor operation. Charts list range of each type of control in voltage and hp., together with either NEMA size or company type number.

Materials Handling

Aluminum Conveyors 70

Harry J. Ferguson Co.—4-page bulletin illustrates portable, aluminum roller-and-wheel gravity conveyors. Operator may conveniently reverse conveyor sections to accommodate different size packages. Thus, with one side up, channels act as guides for carriage of smaller items, while when other side is employed, the wider packages may be handled. Specifications on sizes of rollers and weights are given in table form, and prices are included.

Power-Driven Curve Conveyor 71

Harry J. Ferguson Co.—Leaflet presents features of new power driven curve conveyor. Widths available, operating speed, and motor requirements are given.

Industrial Trucks 72

Clark Equipment Co.—4-page condensed catalog features a tabulated summary of principal specifications of its fork-lift trucks, towing tractors and tructractors. Dimensions, weights, capacities, and turning radii are given for all models, both gas-powered and electric battery-powered.

Materials Handling 73

General Electric Co.—92-page illustrated manual, entitled "Materials Handling", describes modern methods of handling materials in three of the major operations of industry: Receiving, shipping and warehousing. Manual contains a comprehensive survey of materials handling equipment, methods and practices, and there is a convenient compilation of engineering data. A charge of $1.00 per copy is made for this comprehensive publication.

Hand Trucks 74

The Rapid Standard Co., Inc.—2-color bulletin describes new hand truck with zero pressure tires. It illustrates use of the truck and lists specifications and prices of four models.

Control Equipment

Liquid Level Recorder..... 75

Yarnall-Waring Co.—8-page Bulletin WG-1830 presents a liquid level indicating and recording instrument used in boiler plant operation. Features of unit and operation are described, and component parts are illustrated. In addition color sketch shows how various fittings in a pipe system may be anchored to avoid distortion of fittings and misalignment of pipes, at same time permitting expansion joints to "take up" between fixed points.

Process Industry Instruments..... 76

The Brown Instrument Co.—32-page Catalog 6708 describes indicating, recording and controlling instruments for processing industries. Constructional features are detailed and illustrated, and information on how equipment operates is given. Also covered are non-control indicating and recording thermometers, pressure gages, and wet and dry bulb assemblies.

Laboratory Equipment 77

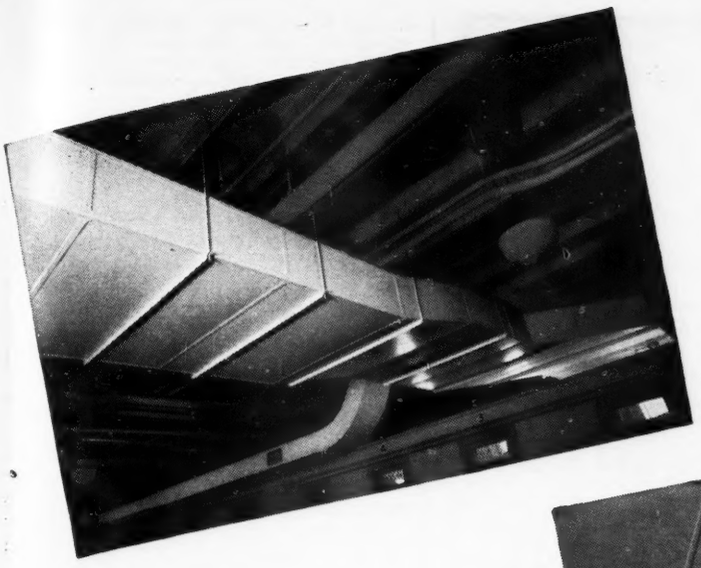
Schaar & Co.—8-page bulletin contains data on various pieces of laboratory equipment, including analytical balances, photoelectric colorimeters, and pH meters. Apparatus is pictured and described, and prices are listed.

Automatic pH Control..... 78

Leeds & Northrup Co.—New leaflet from company concerns Micromax pH recorder, for automatic control of acidity or alkalinity of liquids.

Fritted Glassware 79

Corning Glass Works—11-page booklet on fritted glassware used in laboratories for filtration, gas washing, gas absorption, extrusion and diffusion operations. It presents data on flow rates for water and air through fritted



Warm air duct constructed of Apac.

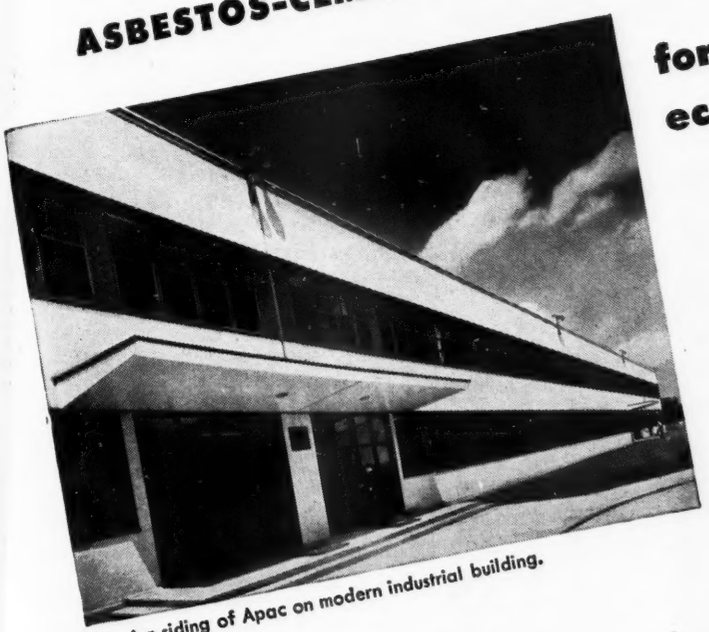
Apac ceiling on industrial-type cafeteria.

Here... there... and everywhere

K&M "Century" APAC

ASBESTOS-CEMENT SHEETS

for fire-resistant... durable... economical construction



Exterior siding of Apac on modern industrial building.

You get long-lasting, economical construction when K&M "Century" Apac board is specified for new building, renovations or as a replacement material.

That's because Apac is made of tough asbestos fibers and Portland cement—a hard-wearing combination that resists fire, rodents, termites, rot, rust and weather. And Apac actually improves with age.

"Century" Apac is economical on any job. Initial cost is surprisingly low. Installation costs are low because Apac is easy to cut — just score it, and snap off; easy to apply— fastens in place with nails or screws; and easy to handle—comes in sheets 4′x 8′ and in thicknesses of 3/16″, 1/4″ and 3/8″.

For further information on how "Century" Apac can help solve your special problems, write direct to us. Your inquiry will receive prompt attention.

DIAMOND ANNIVERSARY 1873 1948 K&M KEASBEY & MATTISON CO.

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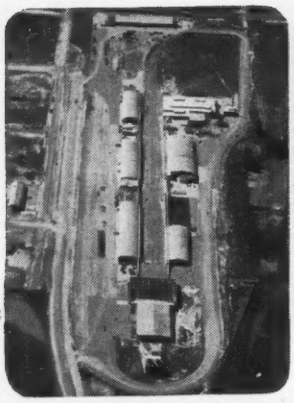


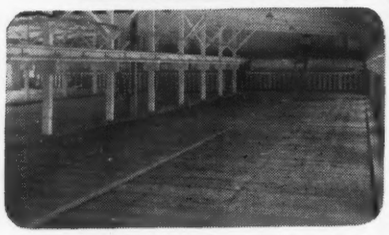
43-Acre Plant from the Air

TRADE FRICK MARK

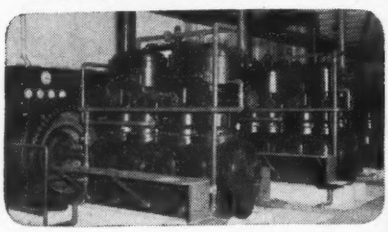
Refrigeration

To Make 600 Tons of Ice a Day for California Shippers

That's the projected output at Salinas, where the Shippers Development Co. has built a $1,400,000 plant to ice vegetables. Five big growers and packers use the product for icing thousands of railway cars and trucks. The Associated Refrigerating Engineers, of Los Angeles, selected Frick equipment for this important job. You, too, will find Frick refrigerating, ice-making, and air conditioning systems most reliable and profitable.



Group Lift Saves Labor on Ice Tanks



Three of the Six Big Frick Machines

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Cost Control and Profits Today . . .

Operators trimming overfilled cartons to 1 lb. net. Heart's Delight Pasteurized Prunes, Richmond-Chase Co., San Jose, California.

With raw material and labor costs at all time highs industry must do tremendous volume to make a profit now. Often volume alone fails to show an adequate profit. Production men by necessity are becoming more cost conscious . . . seek better cost control measures. Trimming costs means increasing profits. This is only possible with better, faster methods, and saving in products. Packaging must eliminate the overweight package . . . correct the underweight container. The control measure here is an EXACT WEIGHT Scale. Remember the uniform package is what it is supposed to be, no more, no less. Priced in line with known operating costs it shows a profit. Write for full details for your plant.

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Exact Weight Scales

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disks, a comparison of efficiencies of certain gas-washing bottles, information on cleaning fritted ware, and some notes concerning satisfactory operating temperatures and pressures.

Electron Microscope 80

Radio Corp. of America—6-page bulletin describes company's new electron microscope. Principles of operation are illustrated diagrammatically, range of microscope is shown graphically. Specifications cover all pertinent data, such as resolving power, depth of focus, and electronic magnification.

Plant Supplies

Produce Packaging Materials..... 81

Dobeckman Co.—2-page foldout concerns packaging of produce in transparent films. Methods used and benefits derived are described. Products packaged sizes of bag employed are given in table.

Pneumatic Atomizing Nozzles..... 82

Spraying Systems Co.—10-page Catalog 23 presents development in pneumatic atomizing nozzles for reducing liquids of all types into uniform, atomized sprays. Illustrations and data detail wide range of types, simplifying selection of nozzles to meet specific requirements in terms of capacities and spray characteristics. Comprehensive capacity and spray dimension tables facilitate selection.

Piston Packing 83

Worthington Pump & Machinery Corp.—Bulletin W-404-B3 illustrates and describes cup type piston packing. Engineering drawings show installation, and construction features are given.

Sodium Tetraphosphate 84

Rumford Chemical Works—8-page Bulletin 65 presents features and industrial applications of sodium tetraphosphate, a water conditioner known commercially as "Quadrafos". Types and sizes of shipping containers are described. Instructions for use are given.

Paper Cups, Containers..... 85

The Paper Cup & Container Inst.—26-page pocket-size catalog contains alphabetical directory of foods and drinks that can be served in paper. Included are recommendations as to size, shape and style of container designed for each.

Miscellaneous

Steel Shelving and Lockers..... 86

Precision Equipment Co.—8-page catalog covers steel shelving, clothing lockers, trucks, work benches and cabinets. Dimensions are given and prices listed.

Fire Extinguishers 87

American-La France-Foamite Corp.—Illustrated literature describes company's 2½-gal. resistance welded silicon bronze fire extinguishers. Types offered are soda-acid, foam, plain water, and anti-freeze water. Units are 4½-lb. lighter in weight than old models.

Use of Silicones 88

General Electric Co.—30-page illustrated Bulletin CDR-57 describes in detail company's silicone products. It covers silicone resins, oils, greases, water repellents, and rubber, together with their many industrial uses. Among applications are gaskets for oven doors, for vacuum chambers and refrigerators. Charts and tables are included for handy reference.

Plastic Products 89

General Electric Co.—18-page illustrated pocket-size booklet, No. CDP-576, describes briefly the various plastic products manufactured by company, together with their numerous industrial applications.

Floor Maintenance 90

Stonhard Co.—Company manual, "Over The Rough Spots", contains information on quick resurfacing of various types of floors. Smooth patching of holes is also detailed.

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

BREWING

Nutrient Loss in Brewing

BREWING and malting of grain have a better record for conservation of nutrients than is generally supposed. Beginning with the malting of the barley, about 95 percent of the original nutrients remain in the finished malt. There is a loss of carbohydrate during germination and growth, but without this malt could not be made. Translation of kernel substance into sprout and rootlets does not represent a loss as these become sources of protein and vitamin concentrates of special quality.

Hydrolysis of starches during mashing results in no loss of substance, and in less than one percent loss in total calorie content. About 80 percent of the carbohydrates goes into solution during mashing but only about a third of the protein, the remainder being left with the grains after filtering the mash. Though this may seem wasteful, actually because of the role of brewers' grains in animal feeding, it is not.

The alcoholic fermentation of the wort has been subjected to most attack as a sacrifice of food and feedstuffs. While about half the weight of the carbohydrates is lost as carbon dioxide during the alcoholic fermentation, 97.5 percent of the calorific value is conserved in the beer produced, when it is used as a food. In the dilute form it has in beer, alcohol acts physiologically as a fuel and spares fats and carbohydrates when ingested.

Digest from "The Brewery as a Member of the Food- and Feedstuff Economy," by Hermann Fink, *Die Brauwelt*, vol. 9, 157–60, April 29, 1948.

FREEZING

Natural Colored Frozen Vegetables

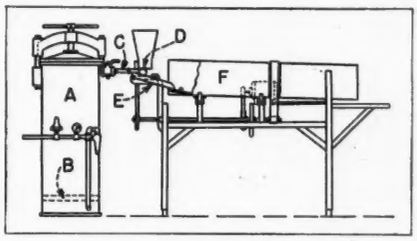
FROZEN VEGETABLES, that retain their natural deep green color upon thawing, are claimed to result from a treatment that has been recently patented. The freshly harvested vegetables, carried on a long conveyor belt of wire mesh or other foraminous material, are first subjected to jets of clean, warm water to remove adherent dirt and foreign matter. After draining, the vegetables pass beneath nozzles supplied with a 20–30 percent NaCl solution. Temperature of the salt solution should be 90–130 deg. F. Time of exposure varies inversely with the temperature —approximately 60 sec. at 100 deg., 25 sec. at 130 deg. F. This treatment is followed by inspection, steam blanching, water cooling and conventional packing and freezing.

Digest from U. S. Patent 2,437,859, issued March 16, 1948, on an application dated June 25, 1945, to O. L. Moulthrop, Selma, Calif., and assigned to Western Frozen Foods Co., Fresno, Calif.

ENGINEERING

Meat Ball Forming Machine

MEAT BALLS formed continuously, without the meat being touched by the operators, is the object of a recently patented device. Ground meat (see diagram) is filled into large cylinder A. Hydraulic pressure applied upon piston B forces the meat from A through pipe C into cylinder D, to be cut off into portions by a reciprocating piston. Portions are wiped from face of the piston at the forward end of each stroke



by a rotary knife, and roll down chute E into the upper end of the inclined rotating drum F. The rotary motion imparted to the cylindrical portions of meat, as they travel downward through drum F, changes them into spherical balls, in which form they are discharged at the lower end of the drum ready for packing or use as desired.

Digest from U. S. Patent 2,442,633, issued June 1, 1948, on an application dated July 9, 1943, to J. M. Archer and J. A. Pepper, Vineland, N. J.

Improved Pea Sheller

ELIMINATION of the conventional viner in the shelling of peas for canning, freezing or drying, and preservation of the peas without substantial impairment of vitamin or other mineral values, and with a minimum amount of wastage, is the object of a recently patented process.

The unshelled pea pods are subjected to a temperature of approximately 2,000 deg. F. for from 2–4 sec., then chilled by contact with water. Gentle agitation of the pods while immersed in water is said to remove the peas which are then separated by screening.

Digest from U. S. Patent 2,437,155, issued March 2, 1948, on an application dated Feb. 5, 1944, to M. E. Dunkley, Modesto, Calif.

POULTRY

Cooling Dressed Poultry

COMPARED with the conventional method of cooling dressed poultry on racks in air in refrigerated rooms, the ice-slush method speeds the cooling rate and improves carcass appearance by preventing loss of moisture. Tests were made on: (1) New York dressed birds with neck and vent ligated; (2) eviscerated birds with neck removed at the base and placed with the edible giblets, and (3) eviscerated birds cut into pieces. Cooling was accomplished in a 5-gal. container of crushed ice and water, the latter being circulated from bottom to surface by a pump. Crushed ice was added as needed to maintain a temperature of 32–33 deg. F. Thermometers and thermocouples were inserted into the carcasses and pieces to determine their temperature.

Compared with 24–48 hr. required

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Staling Inhibitor 202

For Savings

Specify

DARNELL

● **Darnell Casters and Wheels are provided with both rubber-tired wheels as well as semi-steel wheels for satisfactorily meeting any floor condition.**

● **There are many adaptations provided for attaching Darnell Casters to most any type of equipment such as angle fittings, threaded stems, pipe stems, etc.**

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EQUIPMENT
SAVE FLOORS
SAVE MONEY
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36 N. Clinton, Chicago 6, Ill.

to chill dressed poultry by conventional methods, the following results were obtained by the ice-slush method: New York dressed carcasses were cooled to 45 deg. F. in 110 min.; eviscerated whole carcasses in 50 min., and pieces in an average of 20 min. Percent moisture absorption for New York dressed birds was 1.5 (unligated 3.1); for eviscerated carcasses 7.4, and for cut pieces 9.4 Percent moisture absorption by portions decreased as follows; back 12.0, breast 10.4, giblets 7.8, leg 6.5 and wing 6.1. By tissues the percent absorption was; skin 17.3, muscle 13.2, bone 12.1 and adipose 3.3. Much of the water absorbed during slush-chilling was lost during subsequent storage and cooking, but poultry thus chilled contained more moisture after cooking than did the air-cooled product. The slush-cooled product also had a more pleasing appearance than the air-cooled, but no better palatability.

Digest from "Ice Slush Cooling of Dressed Poultry," by R. L. Bailey, G. F. Stewart and Belle Lowe, *Refrigerating Engineering*, vol. 55, 369-71, April, 1948.

DEHYDRATION

Drying Orange Juice

LABORATORY studies on the production of a satisfactory orange juice powder have been made with whole orange juice (12 percent solids) and concentrate (50 percent solids), using both frozen and liquid-film drying. Initial tests showed that a powder of high quality could be made from whole juice if the final moisture content was 1.5 percent, and the finishing drying temperature 113–122 deg. F. The production rate, however, was low; but this was increased five-fold when a 50-percent solids concentrate was dried. Also, the drying rate for liquid films was double that of frozen films. Evidently, use of concentrate offered several advantages: increased production rate, reduced cost for complete drying, and easier handling in the loading of driers. Effect of temperature and time of drying on quality of product was tested by an experienced taste panel on two powders produced at 125–140 deg. F. A marked difference in taste was evident for these two temperatures up to 250 minutes, beyond which there was little difference. On the basis of the taste scale and the experience of the panel, a final drying temperature of 122 deg. F. was selected.

Commercial production of orange juice concentrate and powder, based on the foregoing laboratory investigation, is described in a companion paper. The process consists of the concentration of fresh orange juice to 50 percent solids

(*Continued on page* 194)

available anytime!

Another good reason for choosing this natural food—
rich in B complex vitamins and in high quality proteins

Production of yeast is entirely under control, and its growth (see budding pictures on the opposite page) is not impeded by changing weather or other chance factors, as is the case with most food crops.

This means that yeast can be obtained from Standard Brands in any quantity, in any season of the year.

And that is one of many good reasons primary grown yeast recommends itself to food manufacturers. These are the other reasons:

Yeast is a rich, *natural* source of the entire B-COMPLEX group of vitamins.

Yeast proteins contain, in substantial amounts, the amino acids usually considered essential for growth.

Yeast, irradiated, is a dependable source of vitamin D.

Yeast — in addition to its proteins and vitamins — also contains carbohydrates, fats and minerals.

Abundant, indeed, is the supply of nutritional value already discovered in yeast. More may yet be in the offing, as studies of yeast continue.

Standard Brands Incorporated has three generations of practical manufacturing experience, supplemented by extensive modern facilities for production and research. It is especially qualified to supply yeast and yeast derivatives to the food trades. Outstanding research and excellent manufacturing procedures give assurance of uniformly high quality in Standard Brands products. We invite your inquiries.

Products containing
VITAMIN D

Fleischmann's Hy-Dee
Irradiated Dry Yeast

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Standard Brands Viosterol
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Products containing
NATURAL B-COMPLEX FACTORS

Fleischmann's
Pure Primary Dry Yeasts *(brewer's type)*

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UNIVERSAL COLLOID AGENT

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IT GELS...
IT EMULSIFIES...
IT STABILIZES...
IT THICKENS...

We are now producing from Carragheen two new improved types of gelose. One of them should be the answer to your emulsifying, suspending, thickening or stabilizing problems.

KRIM-KO GEL is an all-purpose colloid-assistant. Properly used, it has been proved effective in many of the most exacting food, pharmaceutical and industrial applications.

CARRAGAR is an agar-type gelatin which forms tender, fruit-like gels over a wide pH range. It does not require acidulation to produce desired results.

Send for free liberal working samples for experimental use.

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THOMSEN
DIRECT DRIVE
SANITARY PUMPS
4 IMPORTANT FEATURES:
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Designed especially to meet the needs of dairies, beverage plants, food processors, creameries, ice cream plants, etc.
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SANITARY EQUIPMENT FOR THE PROCESSING INDUSTRIES

at 10 mm. of mercury absolute, and the subsequent drying of this concentrate at 5 mm. of mercury absolute, or less, to a powder of 2 percent moisture. Engineering details of design and operation, including flow sheets and description of equipment, are given for a plant to produce 5,000 lb of orange juice powder in 24 hr. The dried powder is discharged from the drier through a double air lock into a vacuum powder dolly without being exposed to air and without breaking the vacuum in the drier system. The dolly is removed to a packaging room maintained at 18 percent relative humidity, where the powder is filled into cans that are subsequently vacuumized and filled with dry nitrogen before final closing. The finished product is stored at room temperature.

Digest from "Dehydration of Orange Juice," by A. L. Schroeder and R. H. Cotton, *Industrial and Engineering Chemistry*, vol. 40, 803-7, May, 1948; and "Production of Orange Juice Concentrate and Powder," by H. W. Schwarz and F. E. Penn, *Ibid.*, vol. 40, 938-44, May, 1948.

Dried Whole Egg

DEHYDRATED whole eggs, that are virtually indistinguishable from fresh eggs, even after extended storage are now available. By acidifying the eggs before drying to below 2 percent moisture, and packing in an inert atmosphere the new powder cannot be distinguished from fresh eggs by many observers. A product that will perform as well or better than frozen whole eggs in bakery products is made by the addition of sugar to preserve foaming properties, drying to a moderately low moisture content and storing in an inert atmosphere.

Digest from "Dehydration of Foods," by R. M. Conrad and J. W. Greene, presented before a symposium on food technology, ACS Meeting, Chicago, April 20, 1948.

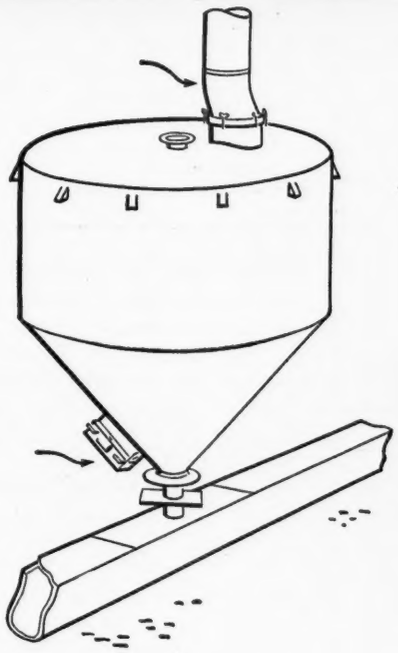
MICROBIOLOGY

Bacterial Content Of Frozen Orange Juice

FROZEN orange juice undergoes a gradual reduction in bacterial count, but does not become entirely free of them even after 7 or 8 months storage. There is an enormous difference in numbers between juices reamed from "good" oranges, showing no visible spoilage, and that from fruit exhibiting "soft rot" spots. Good oranges had total counts of 12,300 per c.c. on tryptone-glucose agar, while soft rot fruits had total counts of 31.5 million. After 7 months storage in the frozen state, the count on juice from sound oranges had dropped to 2,800, while juice from fruit with rot still showed a count of a million or more.

Coliform bacteria were found in-

VIBRATORS KEEP THE POWDER MOVING...BUT THE
Clad Steel stays intact



3/8" Lukens 10% Nickel-Clad Steel was used by Glascote Products, Inc., of Cleveland in making these tanks for M & R Dietetic Laboratories, Inc., Columbus, Ohio.

Powdered milk comes to these storage tanks from the dryer. A vibrator bolted to the outside of each tank helps hurry it along to the packing machines, because milk powder tends to pack and pile up in the cone-shaped bottom.

Two advantages of Lukens Clad Steels are emphasized by this installation: Examination of its nickel-clad interior shows that it is not attacked by the milk powder and the frequent washings with water. The constant hammering those vibrators give the metal proves the integrity of the bond between clad metal and backing plate. Lukens Clad Steels provide *solid* metal protection at the lower cost of *clad* steel.

Lukens Clad Steels—Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad—are now available in the extra-smooth Sodium Hydride Finish, making equipment even easier to clean than before. Plates come as wide as 178" or over 3" thick.

If you're wondering where Lukens Clad Steels will help you cut costs and improve your operations, Bulletins 255 and 338 may contain the data you need. Lukens Steel Company, 401 Lukens Building, Coatesville, Pennsylvania.

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Visit us at the Shows!

Booths 9 and 10
The National Chemical Exposition
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October 12 thru 16

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National Metal Exposition
Convention Hall, Philadelphia
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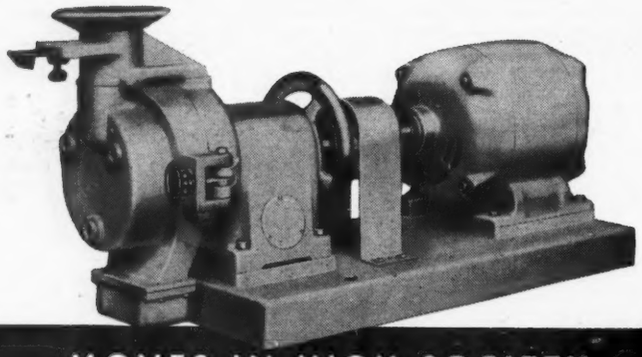
STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •



MOVES IN HIGH SOCIETY

Bauer LABORATORY MILL

The U. S. Department of Agriculture has approved the new Bauer No. 148-1-A Laboratory Mill for preparing samples of cottonseeds, soybeans, and tung nuts. The American Tung Oil Association specifies it for sample grinding, and all the major soybean processors use it. The American Oil Chemists' Society endorses the mill, and it is used in the laboratories and research departments of universities, colleges, agricultural experiment stations, and prominent manufacturing companies.

This precision-built, rugged mill is adjustable for fine and coarse grinding; for granulating, comminuting, or cracking; for decorticating small samples of seeds. It handles all grindable materials. It recovers the entire sample. Discs or plates in wide variety are available for special purposes.

If you are interested in a mill for experimental work and test runs, ask for complete information about the Bauer No. 148-1-A.

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Sept. 1948

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Youre right! Todays market is cluttered with rotary pump manufacturers. For many it is just a sideline.

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itially in both types of juice, but only about one per c.c. in the juice from sound oranges. None could be isolated after one month's frozen storage. In the juice from fruit with rots, the initial coliform count was 2,000 per c.c. and over 20 per c.c. could be isolated after 8 months' storage in the frozen state.

The coliform bacteria isolated from the juice of oranges with soft rot, belong to the *Aerogenes* group in most cases and only rarely to the *Escherichia* genus. Because the presence of Aerogenes does not carry the suspicion of poor sanitation implied by the Escherichia group, identification of species may be more important in bacterial examination of orange juice than the establishing of the presence of groups.

Digest from "Condition of Oranges as Affecting Bacterial Content of Frozen Juice with Emphasis on Coliform Organisms," by E. R. Wolford and J. A. Berry, *Food Research*, vol. 13, 172–78, March–April, 1948.

DAIRY

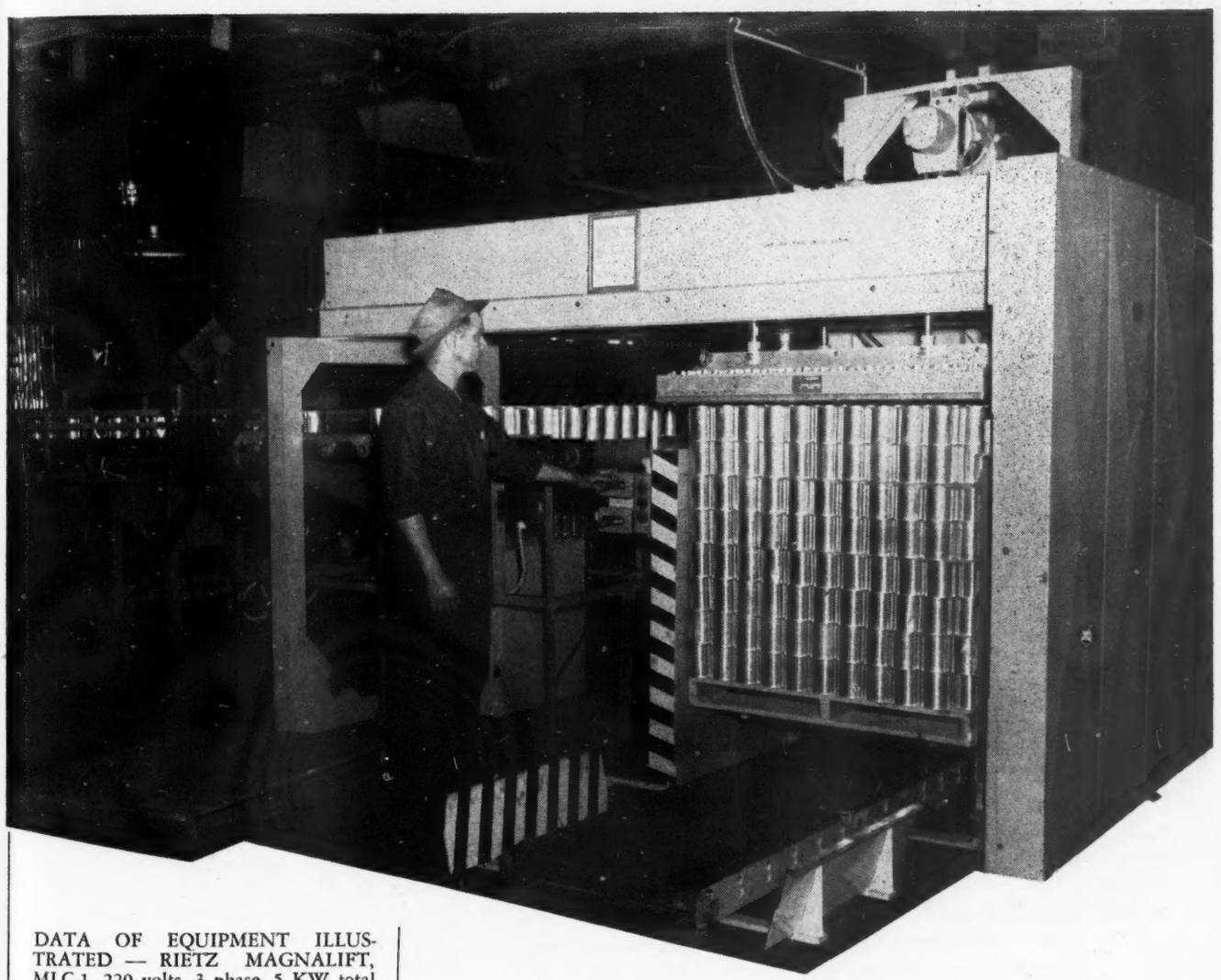
Tyramine in Cheese

RELATIVELY little is known about the amino acids freed in cheese during ripening, and still less about the amines that may be formed from them. Accordingly a quantitative study was made of the tyramine, the amine derived from tyrosine. A method was evolved for determining tyramine in cheese, and a large number of cheeses were analyzed.

Analysis of 25 commercial American Cheddar cheeses ranging in age from 2 months to 3 years showed an average tyramine content of 0.0384 percent, with a high of 0.1199 and a low of 0.0025. One very old Cheddar not included in the foregoing group was found to contain 0.223 percent. A large number of miscellaneous varieties of ripened types of commercial cheese were tested and found to contain tyramine in various concentrations. The largest amount was found in a Liederkranz with a concentration of 0.1683 percent, and the lowest in a Roquefort with a concentration of 0.0048 percent.

Earlier work by the same authors having established the fact that the flavor of Cheddar cheese was intensified by *Streptococcus faecalis* as a starter, and that tyramine was found in all Cheddar cheeses examined, it was logical to investigate the possible relationship between tyramine content and intensity of Cheddar flavor. Numerous samples of commercial Cheddar from four states and one 10-year old sample made at Cornell University from raw milk were arranged in order of flavor intensity by three experienced judges. Experimental cheeses also were made, using commercial lactic,

Now mechanical unloading of pallets with MAGNALIFT



DATA OF EQUIPMENT ILLUSTRATED — RIETZ MAGNALIFT, MLC-1, 220 volts, 3 phase, 5 KW total connected power, (4 KW for the magnet alone.) Magnet surface 36″ x 48″; horizontal travel 8 feet; vertical lift of pallet elevator 43″; overall dimensions: length 11 feet, width 5 feet, height to top of elevator frame 8 feet. Sequence of elevator, magnet and carriage movements are electrically interlocked, semi-automatic. Handwheel control on carriage adjusts position of magnet for any size can from picnics to number tens.

RIETZ MAGNALIFTS available for practically any size pallet or tray, with elevator chamber for left, right or center reception. Carriages furnished for any length of horizontal travel, for one or more receiving lines. The MAGNALIFT SYSTEM is applicable to loading as well as unloading of pallets, trays and retort baskets, and to miscellaneous transfer services.

As a mechanical feeder for labeling and casing lines, Magnalift transfers cans from pallet to receiving belt, layer by layer, at *double* the rate of manual unloading with four men. One man operation by electric, semi-automatic control reduces handling costs and minimizes dents.

Savings on installation illustrated can pay for this equipment in one year. Available on outright purchase or rental purchase.

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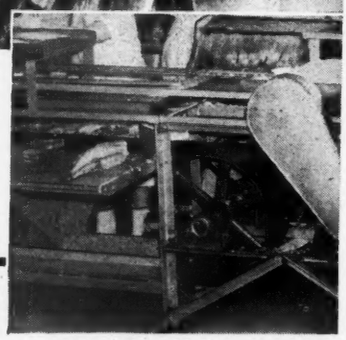
DIVISION OF JOS. WAGNER MFG. CO.

Tons of fish ride from ship to cannery on *one continuous, flat strip of solid, stainless steel* in this SANDVIK conveyor installation.

Here's another kind of SANDVIK STAINLESS STEEL-BELT CONVEYOR



SANDVIK steel-belt conveyor in a fish packing plant.

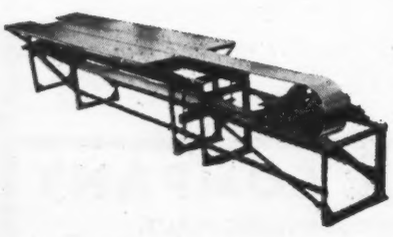
If you handle fish, meat, margarine, sugar, chocolate or other types of food, SANDVIK can engineer a complete steel-belt unit to fit your requirements.

You can have practically any belt length and width that you wish. Belts can be flat or troughed. On conveyor table units, height of belt from floor can be arranged to give correct working height despite special floor conditions.

3 BIG ADVANTAGES

1. EASY TO KEEP CLEAN—Live steam or boiling water can be applied directly without danger of corrosion.
2. SMOOTH, IMPERMEABLE SURFACE—No place for particles to lodge. No danger of taste contamination. Easy on-or-off handling.
3. LONG SERVICE LIFE—Inherent high strength and resistance to time and wear.

Write for further information:



SANDVIK stainless belt meat-conveying table with stainless steel work table adjacent.

SANDVIK STEEL BELT CONVEYORS SS-33

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commercial lactic plus *S. faecalis*, and *S. faecalis* starters. Analyses revealed a direct relationship between tyramine content and intensity of flavor. It was shown, however, that tyramine was not the flavor compound, but served as a means of measuring bacterial activity that accentuated flavor production. The activity of bacteria producing tyramine did not account for all the cheese flavor. Increase in titratable acidity was related directly to flavor intensity. In a general way the increase in volatile fatty acids and water soluble nitrogen was related to flavor intensity, but there was no definite correlation.

Digest from "The Tyramine Content of Cheese," and "The Relationship of the Amount of Tyramine and the Numbers of *Streptococcus faecalis* to the Intensity of Flavor in American Cheddar Cheese," by F. V. Kosikowski and A. C. Dahlberg, *Journal of Dairy Science*, vol. 31, 293–303, 305–14, April, 1948.

Foaming of Milk

MILK lipids, including phospholipids, have been studied in a series of investigations on the role of surface-active constituents involved in the foaming of milk and milk products. Materials used in the study were milk fat obtained by churning fresh cream, and soybean phospholipids. Natural emulsions were made by diluting cream with appropriate volumes of its separated milk. Artificial emulsions were made by dispersing the fat, with or without added phospholipid, in pasteurized separated milk. The results clarify in some measure the problem of making artificial emulsions of milk fat with properties similar to the natural product. Other results are summarized below.

At temperatures between 41 and 122 deg. F. both natural and artificial emulsions yield two types of foam which may appear separately or simultaneously—a protein type and a phospholipid type. The former predominates at higher temperatures. Whole milk, cream and buttermilk show minimum foaming at 86–95 deg. F. At 95 deg. the foam volume and foam stability of skim milk decrease as the fat content increases up to 5.0 percent. On further increases in fat content, both volume and stability of foam increase up to a fat content of 20 percent, after which no further increases occur. At 43 deg. F., foam volume is constant regardless of fat content. Stability reaches a minimum at about 5 percent fat, after which it increases rapidly until a fat content of 10 percent is reached, above which cream-type foams of high stability are formed.

Artificial milks and creams were made to resemble natural products only when soybean phospholipids were incorporated into the fat prior to emulsion. The most normal cream was made when the medium contained natural fat globule "membrane" mate-

"If it's made of cast iron it can be made better with Ni-Resist"

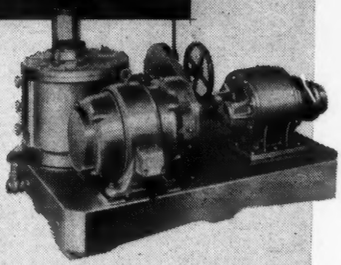
Users Know . . .

NI-RESIST PERFORMS BETTER LONGER

CUT FOOD PROCESSING COSTS WITH NI-RESIST

Millions of pounds of Ni-Resist*, a nickel cast iron alloy, are produced annually for food processing machinery. Castings made of Ni-Resist combat corrosion and wear, thus reducing maintenance costs, increasing efficiency and prolonging the productive life of the equipment.

NI-RESIST CURBS CORROSION AND WEAR IN WASHER-ELEVATORS



Using no lubricant except water, this machine handles green peas, lima beans, beets, cherries and cranberries, as well as hominy, pea beans and similar dry products. Corrosion from water and food juices . . . and wear from sand and silt . . . are curbed by Ni-Resist (Type 2) cast parts, produced by Sterling Foundry Co., Wellington, Ohio. The builder of machines like this one, Scott Viner Company, Columbus, Ohio, writes: *"Ni-Resist has been found most satisfactory, and has solved both problems."*

NI-RESIST RANGE TOPS STAY FLAT, SMOOTH AND CRACK-FREE LONGER

Ni-Resist tops do more than cut fuel costs and cooking time. They resist warpage, cracking, buckling and other forces introduced by high operating temperatures in ranges . . . they *perform better longer* than ordinary, unalloyed cast iron tops. That's why Standard Gas Equipment Corp., Baltimore, Md., offers Ni-Resist (Type 2) tops, like the one shown here, produced by their subsidiary Alabama Foundry Co., Birmingham, Ala.

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Oliver United Filters, Inc. for many years have used Ni-Resist for drums and grids of continuous filters that handle salt, acids and caustics. Ni-Resist provides extra resistance to corrosive attacks, and thus prolongs equipment life, and minimizes contamination of the products.

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- TOLEDO SCALE CO., OF CANADA, LTD., *Windsor, Ontario*
  Meat choppers
- BAKER-PERKINS CO., *Saginaw, Michigan*
  Bread dough dividers
- JOHN B. ADT CO., *Baltimore, Maryland*
  Whiskey distillery equipment
- HOBART MANUFACTURING CO., *Troy, Ohio*
  Dishwashers
- DOUGHNUT CORPORATION OF AMERICA, *New York, N. Y.*
  Waffle baking units

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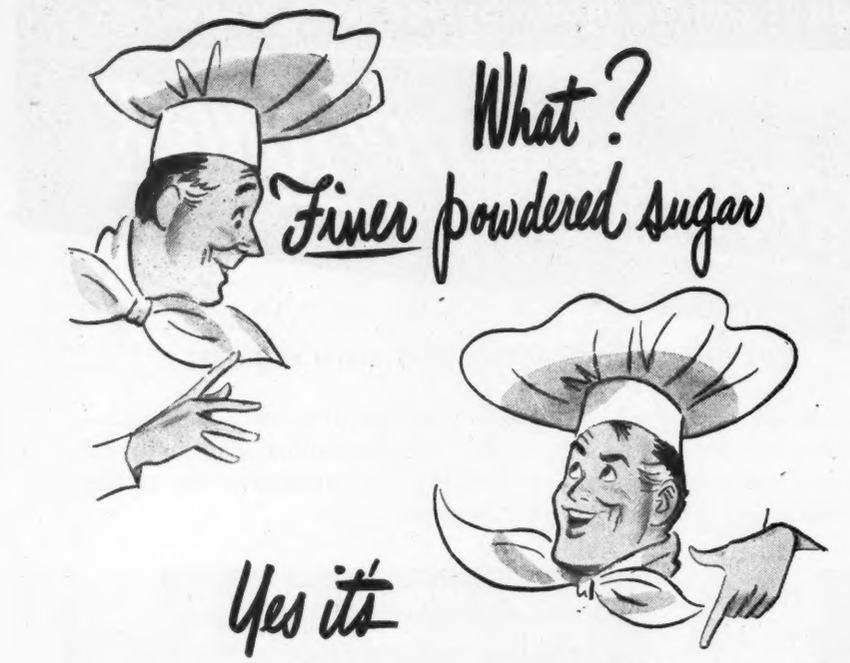

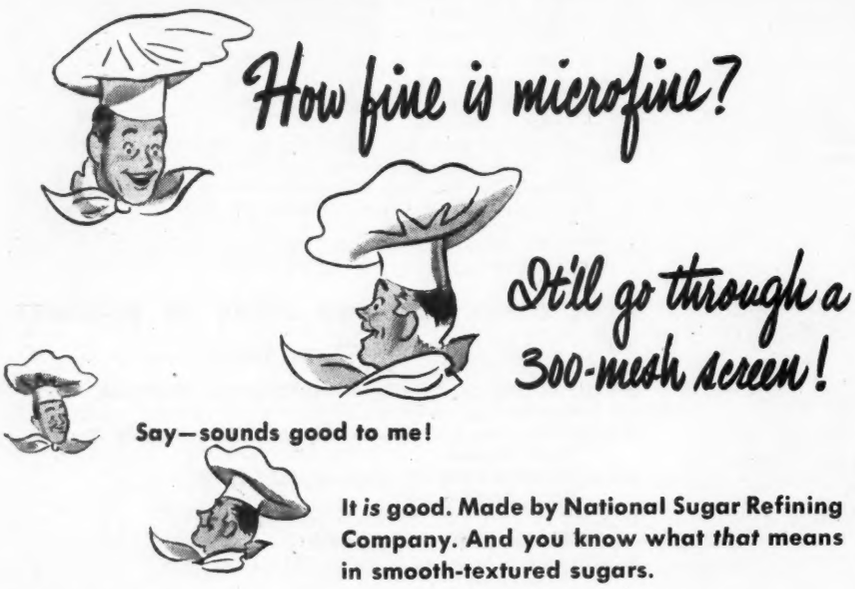

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YES—if you've been wishing for a finer powdered sugar than the one you now use, MICROFINE is it!

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rial. Emulsions of pure milk fat in skim milk, gelatin, or gum arabic sols have abnormal foaming properties. For emulsions of fat dispersed to a degree comparable to that of natural milk or cream, the optimum concentration of mixed phospholipids in the fat appears to be from 0.8–1.0 percent. Unbound phospholipid seems undesirable.

Digest from "The Role of Surface Active Constituents Involved in the Foaming of Milk and Certain Milk Products," by G. A. Richardson and M. S. El-Rafey, *Journal of Dairy Science*, vol. 31, 223-39, April, 1948.

Lactose from Raw Whey

RELATIVELY pure lactose, obtained by crystallization from concentrated whey without previous removal of coagulated proteins, or the addition of chemicals, is the object of a recently patented process. The whey is preheated, then quickly heated to 220–260 deg. F., preferably by the introduction of live steam, and concentrated under vacuum to 50–55 percent solids. The concentrate is seeded with lactose crystals and allowed to stand until the lactose settles out. Lactose is separated from the mass of material, centrifuged and washed.

Digest from U. S. Patent 2,439,612, issued April 13, 1948, on an application dated Sept. 28, 1942, to D. D. Peebles, Hillsborough and T. V. Marquis, Santa Cruz, Calif., and assigned to Western Condensing Co., San Francisco, Calif.

PACKAGING

New Plastic Containers

FRUITS, vegetables and tobacco can be kept fresh for 6 months or more in containers made of new moisture resistant plastics known as S-polymers, which are entirely derived from petroleum. They are said to be superior to wax in moisture-proofing paper because they do not crack when creased. The packaging excellence is said to stem from the resistance of the plastics to moisture and gas penetration.

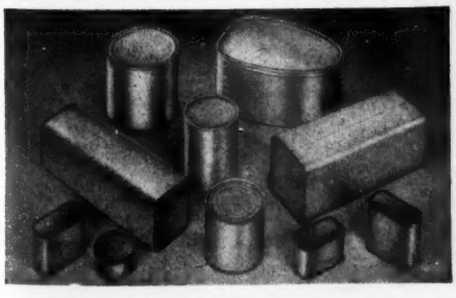
Digest from "A New Series of All-Hydrocarbon Thermoplastic Resinous Copolymers," by R. G. Newberg and O. C. Slotterbeck, presented at ACS Meeting, Chicago, April 21, 1948.

MISCELLANEOUS

Synthetic Caffeine

PRODUCTION of synthetic caffeine at a maximum rate of 11,000 lb. per month by the Wm. Traube synthesis at C. H. Boehringer Sohn, Ingleheim Am Rhein, Germany, is discussed in a report on German caffeine production. Briefly the process is as follows: Cyanoethylacetate, prepared from chloracetic acid, is condensed with

Uncanny Facts
A whole sheep... in a can! In Paris, in 1852, an entire sheep was packed in a huge can just to prove that it could be done!
Thar's nutrition in them thar juices! Housewives are urged to use the fluids which are found in canned foods. In this way it's possible to benefit from all the value of food packed in cans.
The power of suggestion! Continental's suggestion system pays employees for new ideas to improve operations, machinery, products or services. Many improvements have come from this source.
Fibre can take it! They're light in weight but extremely strong, these Continental fibre shipping drums. They're made to ship up to 400 pounds of dry, bulk products.
You've never seen a whole sheep in a can. But we'll bet you have seen lamb stew -- and enjoyed it, too! And ham, and roast beef, and corned beef hash -- all packed in cans.
Back in 1852, meat canning was just out of the experimental stage. (That year Sir Edward Belcher took "preserved meat" with him on an arctic expedition.) Today, 25 or more varieties of meat, from beef stew to Vienna sausage, are packed in cans.
Continental has done its part to help the meat-packing industry grow. Through research and cooperation we hope to do even more. That goes, too, in making paper cups and containers, fibre drums, plastics, and crowns. Which is why our customers agree: "The bigger the family... the better the service."
The bigger the family...
CONTINENTAL CAN COMPANY
... the better the service!



You'll find some interesting facts that will give you a better understanding of Continental in this current national ad. In your field, you'll find Continental offers the best in plain round cans with double seamed ends, and key-opening tear-strip cans—the latter in a wide variety of sizes and shapes.

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urea and sodium in alcoholic solution to give iminouracil. This is converted to the isonitroso derivative by treatment with aqueous nitrous acid without isolation. The resulting compound is filtered, washed and reduced to the aminouracil by zinc and sulphuric acid at 77 deg. F. The resulting slurry is washed and in the moist state, added to 40 percent formic acid and boiled for 8 hr. The formyl derivative is filtered, washed and methylated with methyl chloride and sodium hydroxide solution in aqueous suspension at 176 deg. F. As soon as the caustic soda solution is added the reaction is called complete. The process produces overall yields of 40–50 percent caffeine based upon the cyanacetic ester.

Digest from "Manufacture of Synthetic Caffeine," an 11-page report, PB-42657 now on sale by the Office of Technical Services, Dept. of Commerce, Washington 25, D. C. Price 25¢.

Controlling Dust Explosions

SUPPRESSION of secondary explosions in flour mills after air attacks was the aim of a method evolved in Great Britain. Packets of incombustible dust were so placed in the mill buildings as to be broken open, and their contents dispersed by the high explosive simultaneously with the liberation of combustible dust from the damaged mill. Limestone was found to be effective in concentrations of 2.73 parts to one part of flour, but this quantity interferred with mill operations. Addition of 10 percent $NaHCO_3$ to the limestone greatly enhanced its flame-suppressing power. Investigation into the agglomerating, caking and segregating characteristics of this mixture resulted in the addition of about 1 percent water repellent such as stearic acid to impede water absorption by the $NaHCO_3$. This mixture did not cake in storage to a degree which would prevent its dispersion on explosion, nor segregate by vibration.

Digest from "The Prevention of Dust Explosions Caused by High Explosive Bombs in Flour Mills," by J. H. Burgoyne and D. J. Rasbash, *Journal of the Society of Chemical Industry*, 130-39, April, 1948.

Staling Inhibitor

IMPROVEMENT in keeping quality of bread and other baked goods is the object of a recently patented invention. According to the patent, this is accomplished by the addition of from 0.25–1.50 percent bentonite to the flour or dough before baking. It is further claimed that the addition of a small amount of an inorganic salt such as monocalcium phosphate to the bentonite-flour mixture will further retard staling.

Digest from U. S. Patent 2,443,138, issued June 8, 1948, on an application dated Nov. 6, 1943, to E. G. Holden, Jr., Lemoore, Calif., and assigned to American Colloid Co., Chicago.

BOOKS

Food Studies

ADVANCES IN FOOD RESEARCH, Vol. I. Edited by A. M. Mrak and George F. Stewart. Published by Academic Press, Inc., 125 E. 23rd St., New York City, 1948. 459 pages; 6¼x9¼ in.; cloth. Price $7.50.

Here is the first volume in a projected series designed to provide a medium in which every phase of food research may be exhaustively and critically reviewed on a continuing basis. The rapid and widely spread expansion of food research, in recent years, has brought about a trend toward specialization. And that trend is causing a loss of contact between workers in the various phases of the science. A coordinating and integrating outlet, such as is represented by this book, has therefore become highly necessary.

This volume includes such diversified subjects as The Physiology and Chemistry of Rigor Mortis, With Special Reference to the Aging of Beef; Factors Influencing the Vitamin Content of Canned Foods; Biochemical Factors Influencing the Shelflife of Dried Whole Eggs and Means for Their Control; Deterioration of Processed Potatoes; Microbial Inhibition by Food Preservatives; and High-Polymer Pectins and Their Deesterification.

British Research

FOOD INVESTIGATION. Published for British Government's Department of Science & Industry, Park House, 24 Rutland Gate, London, S. W. 7, 1948. 42 pages; 6x9½ in.; paper. Price 25c., at British Information Service, 30 Rockefeller Plaza, New York City 20.

This booklet outlines the food research carried out in England during the war and through 1946. The portion covering the war period is devoted largely to work on drying of various foods. By 1946, investigations into the quality of meat had begun in earnest. These studies brought useful information on meat tissues.

Patent Uses

THE FUNDAMENTALS OF PATENT TECHNOLOGY. By B. H. Weil, John C. Lane, Edward Taylor Newton and Harry H. Semmes. Published by Georgia School of Technology State Experiment Station, Atlanta, Ga., 1948. 35 pages, 6x8½ in.; paper. Free.

This is a collection of papers on the broad subject of patents. Originally appearing in *The Research Engineer*, bimonthly publication of Georgia Tech's State Experiment Station, the papers were designed to provide engineers and industrialists—particularly those of the Southeast—with a thorough knowledge of patent procedure, not only as a protection for the inventor, but as a stimulus to industrial development. The collection will dispel much of the confusion on this subject.

Motor Reference

ELECTRIC MOTOR MAINTENANCE. By W. W. McCullough. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1947. 126 pages; 5¾x8¾ in.; cloth. Price, $2.

Food plant electricians and mechanics will find here a convenient book on the maintenance and repair of electric motors. It describes the procedures to be followed in the inspection of each type of motor as well as just how to go about taking care of them.

The construction of each motor is also told in detail as are the methods used in testing, cleaning and drying insulation. It is a useful manual to keep in a handy place.

GOVERNMENT PUBLICATIONS

The following recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the Bureau responsible for its issue.

SURVEY OF FISH PROCESSORS. Office of Temporary Controls, OPA Economic Data Series No. 23. Price 10 cents. Summary of operating and unit cost data, various periods, 1936 to 1944.

METHODS AND RESULTS OF ANALYSIS AND EXAMINATION OF CANDY AND ITS INGREDIENTS. Bureau of Agricultural and Industrial Chemistry, AIC-182. Mimeographed. A list of references.

CANDY: ITS INGREDIENTS AND MANUFACTURE. Bureau of Agricultural and Industrial Chemistry, AIC-181. Mimeographed. A list of references.

QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1944. Geological Survey Water-Supply Paper 1022. Price 55 cents. Resume of the work of the Survey and numerous cooperating State agencies on

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the composition and character of surface-water supply throughout the country. An excellent reference book for general use and in many cases of considerable value regarding specific local conditions.

DIRECTORY OF ORGANIZATION AND FIELD ACTIVITIES OF THE DEPARTMENT OF AGRICULTURE: 1947. U. S. Department of Agriculture, Miscellaneous Publication No. 640. Price 50 cents. Describes institutions and lists major technical personnel.

A SUMMATION OF NATION-WIDE RESULTS WITH NEWER FUNGICIDES. Bureau of Plant Industry, The Plant Disease Reporter, Supplement 176. Mimeographed. Report of 1947 fungicide tests done by the Department of Agriculture and others. Essentially a set of abstracts of experimental findings published last year.

WHEAT PRODUCTION, FARM DISPOSITION, AND VALUE, BY STATES, 1909-44. Bureau of Agricultural Economics. Processed. An elaborate statistical report.

SWEETPOTATOES PRODUCTION, FARM DISPOSITION, AND VALUE, BY STATES, 1909-45. Bureau of Agricultural Economics. Processed. An elaborate statistical report.

UNITS OF LIVESTOCK PRODUCTION. By R. D. Jennings. Bureau of Agricultural Economics, F. M. 63. Mimeographed. A measure of grain consumption at the national level. An analysis of the relative feed-using activity of different animals.

DORMANCY AND THE EFFECT OF STORAGE ON OATS, BARLEY, AND SORGHUM. By Edgar Brown, et al. U. S. Department of Agriculture, Technical Bulletin No. 953. Price 10c. Test of dormancy reaction and determination of the effect of storage after ripening.

MINT FARMING. By A. F. Sievers and E. C. Stevenson. U. S. Department of Agriculture, Farmers' Bulletin No. 1988. Available on request to Office of Information, U. S. Department of Agriculture, Washington 25, D. C. Includes description of equipment for recovery of mint oil by steam distillation.

ESTIMATION OF THE COMPOSITION OF LAMB CARCASSES AND CUTS. By O. G. Hankins. U. S. Department of Agriculture, Technical Bulletin No. 944. Price 5c.

THE VISCOSITY AND HEAT STABILITY OF CONCENTRATED MILKS SUBJECTED TO HIGH TEMPERATURE PROCESSING. By B. H. Webb and C. F. Hufnagel. Bureau of Dairy Industry, BDIM-Inf-61. Processed.

FEDERAL SPECIFICATIONS. New or revised specifications which make up Federal Standard Stock Catalog have been issued on the following items: Potatoes; Sweet, Canned JJJ-P-611a. Grapefruit and Orange Juice; Blended, Canned Z-G-691. Price 5c. each.

AGRICULTURAL STATISTICS, 1947. U. S. Department of Agriculture. Price $2.

PATENTS

Proteins Hydrolyzed to Obtain Amino Acids Including Tryptophane by Heat-Treating with Sulphurous Acid at 100 to 180 deg. C.—A. M. Moos to American Cyanamid Co., New York. No. 2,442,055. May 25, 1948.

Glucoside, Hesperidin, Recovered from Orange and other Citrus Fruit Pulp—W. E. Baier, Ontario, Calif. to California Fruit Growers Exchange, Los Angeles. No. 2,442,110. May 25, 1948.

Food Products Diced by Combination Slicing and Splitting Machine—P. F. Quinn and H. J. Qualheim to Qualheim, Inc. Racine, Wis. No. 2,442,210. May 25, 1948.

Candies and Similar Individual Units Widely Distributed over Depositor Conveyor Belt Mechanically Gathered into Close Formation and Arranged in Convenient Order for Packaging—Wm. Spain, Villa Park, Ill. to E. J. Brach & Sons, Chicago. No. 2,442,250. May 25, 1948.

Calcium Ascorbate Solutions with pH of 5.2 to 5.6 Stabilized by Addition of Aliphatic Thiocarboxylic Acid—Walter Karrer, Riehen, near Basel, Switzerland, to Hoffman-La Roche, Inc., Nutley, N. J. No. 2,442,461. June 1, 1948.

Shell Eggs Cleaned and Candled in Continuous Manner during Passage Through Combination Candling, Washing and Drying Unit—O. W. Swanson, Ottumwa, Iowa. No. 2,442,475. June 1, 1948.

Lactic Acid Bacteria Grown on Milk-Substratum Obtained in Pure Culture, Free from Casein, by Centrifuging—Erik Gunnar Mejlbo, Charlottenlund, Denmark to A/S Enico, Copenhagen, Denmark. No. 2,442,502. June 1, 1948.

Fruit Mechanically Conveyed and Assorted According to Weight—E. A. White, Lewiston, Idaho. No. 2,442,521. June 1, 1948.

Triglyceride Fat Containing Radicals of Fatty Acids Differing in Melting Point Heat-Treated at Below 160 deg. F. and in Presence of Catalyst to Obtain Low Temperature Molecular Rearrangement to Permit Crystallization of Solid Triglycerides of Low Solubility as they are Formed—E. W. Eckey, Wyoming, Ohio to Procter & Gamble Co., Cincinnati. No. 2,442,531. June 1, 1948.

Edible Fat Glyceride Mixtures Treated at Below 140 deg. F. in Presence of Catalyst to Obtain Low Temperature Molecular Arrangement with Modification of Chemical and Physical Characteristic and Improvement of Usefulness in Manufacture of Food—E. W. Eckey, Wyoming, Ohio to Procter and Gamble Co., Cincinnati. No. 2,442,532. June 1, 1948.

Triglyceride Fat Consisting of Combined Fatty Acids with Varying Molecular Structure Heated at Below 110 deg. F. in Presence of Catalyst to Obtain Low Temperature Molecular Rearrangement and Permit Crystallization of Solid Triglycerides of Low Solubility and their Removal under Conditions which Inhibit Reversal—E. W. Eckey, Wyoming, Ohio to Procter & Gamble Co., Cincinnati. No. 2,442,533. June 1, 1948.

Fatty-Acid Glyceride Heated at Below 180 deg. F. in Presence of Organic Compound Containing at least One Unesterified Alcoholic Hydroxyl Group and Catalyst to Obtain Low Temperature Interesterification to Form Mono- and Diglyceride—E. W. Eckey, Wyoming, Ohio to Procter and Gamble Co., Cincinnati. No. 2,442,534. June 1, 1948.

Triglycerides Constituted of Combined Fatty Acids Differing in Molecular Structure Heated at Below 160 deg. F. in Presence of Catalyst to Obtain Low Temperature Interesterification and Permit Progressive Crystallization of Triglycerides of Low Solubility as Formed during Interesterification—E. W. Eckey, Wyoming, Ohio to the Procter & Gamble Co., Cincinnati. No. 2,442,535. June 1, 1948.

Coconut Oil and Hydrogenated Derivatives Heated at Below 130 deg. F. in Presence of Catalyst to Obtain Low Temperature Interesterification and Molecular Rearrangement to Convert Glyceride Mixture into Edible Confectioners' Hard Butter—E. W. Eckey, Wyoming, Ohio to Procter & Gamble Co., Cincinnati. No. 2,442,536. June 1, 1948.

All-Vegetable Triglyceride Oil Converted to Puff Pastry Shortening by Partial Hydrogenation and Interesterification in Presence of Low Temperature Catalyst at Below 120 deg. F. to Obtain Product with Melting Temperature at about 117 deg. F.—E. W. Eckey, Wyoming, Ohio to Procter and Gamble Co., Cincinnati. No. 2,442,537. June 1, 1948.

Triglyceride Mixture Consisting Essentially of Unsaturated Glyceride Oil Subjected to Low Temperature Interesterification at Below 100 deg. F. to Give Triglyceride Crystals Consisting Predominantly of Di-saturated-Mono-unsaturated Glycerides—A. D. Abbott, Fairfax, Calif. to Procter & Gamble Co., Cincinnati, O. No. 2,442,538. June 1, 1948.

Glyceride Fat Consisting of Combination of Fatty Acids Mixed with Glycerides from Previous Ester-interchange and Subjected to Ester-interchange Reaction—E. W. Eckey, Wyoming, Ohio to Proctor & Gamble Co., Cincinnati. No. 2,442,539. June 1, 1948.

Vegetables Mechanically Peeled in Unit Lined with Sprayed Stainless Steel Abrasing Surface—D. Horton, Jr. to P. H. Davis, Jr., Erie, Pa. No. 2,442,600. June 1, 1948.

Printed copies of patents are obtainable, at a cost of 25c each, directly from U. S. Patent Office, Washington, D. C.

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Operating Costs

(*Continued from page* 119)

that high velocities are very desirable, but let us look at this matter from a different viewpoint. In one test, cans were placed as close together as possible and the fan was placed about 3 ft. from the first row of cans. The air velocity was decreased tremendously by the obstruction. In other words, if ice cream is placed in large stacks and air blown on the stacks from any one direction, only the outside cans are hardened quickly. The inside cans are hardening at a relatively slow rate.

Recent checks on velocities in hardening rooms where new blower systems have been used disclosed that at 6 to 8 ft. from the blower the air had a linear travel of approximately 600 fpm. But at 8 to 10 ft. from this particular point, behind some of the stacks of packages and cans, the velocity was down to approximately 0 fpm.

From this it is easy to understand why ice cream must be properly stacked in the hardening room, and that to be effective the movement of air must be uniform and not spotty. It does very little good merely to put in a fan and stir up a great blast of air at one point —unless a large number of the cans or packages can be reached.

Type of Container. Metal is a much better conductor of heat than is paper; so, offhand, one would expect that ice cream in metal cans would harden more rapidly then ice cream in paper cans. But tests by Tracy and McCown have shown that paper cartons and paper cans of ice cream harden just as fast, if not a bit faster than ice cream packed in metal containers. This is not only surprising, but also very pleasant news to the industry. Also, it was noted that painting the bright metal cans to reduce radiation shortens the hardening time 15 percent.

Frost in Hardening Room

It is quite common to see large amounts of frost on the coils in low temperature hardening rooms. These accumulations have made necessary the installation of excessive heat transfer surface in the rooms. Ice machines must operate at extremely low back pressures.

Some ice cream plants are using a method of introducing dry air, and they are keeping the hardening room under a slight static pressure. When doors are opened, cold air is forced out, preventing the entrance of warm, moisture laden air. By being passed over a fin coil system, the incoming air is dehumidified, thereby enabling the hardening room to be run many years with practically no accumulation of frost.

What is the best mechanical method of transferring heat from the hardening room? Some companies recommend old-style coils; some prefer the new fin coil with greatly reduced head room; others like blowers; and still others the blast system of hardening. There are great differences in the way these various pieces of equipment work and it would seem that there should be more agreement among refrigeration companies as to the method to be used.

At present, there is new interest in the blower for hardening rooms. The greatest difficulty has been the discomfort to employees caused by the air blasts. But working conditions could be greatly improved if modern air conditioning methods were used to reduce the air velocity in the hardening rooms and still give positive circulation. The dairyman wonders why a method such as the plenum chamber has not been used more widely

Booster Compressors

Where a steady low back pressure load exists, booster compressors are frequently cheaper to operate than are single stage compressors. Even in new installations, however, some plants have completely ignored two-stage compression. There are, no doubt, many cases where two-stage compression is not practical because of tremendous variations in peak loads, but the advantages and disadvantages of this system should be carefully considered when new refrigerating equipment is to be purchased.

Variable Loads

One of the big difficulties in designing refrigeration for an ice cream plant is the aforementioned great fluctuation in loads encountered from season to season and day to day. In many cases, there are no large steady loads which can be used as a basis for design, but rather operations running from 25 percent to 100 percent of peak capacity.

The question is: What should the dairy engineer do in designing an operation? Should he use multiple or single-stage compressors, variable speed drives, capacity pockets, or two-speed motors? It seems that we get as many recommendations as companies called in on the job. Somewhere along the line, however, there must be a happy medium.

Regarding Power

One of the problems deserving considerable attention is the power factor. In many plants it is extremely poor, and the dairy is penalized because someone has not given the proper attention to correcting these bad power factors. Before any final decisions are made regarding refrigeration equip-

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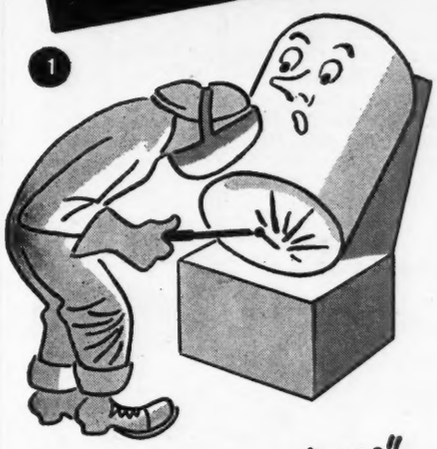

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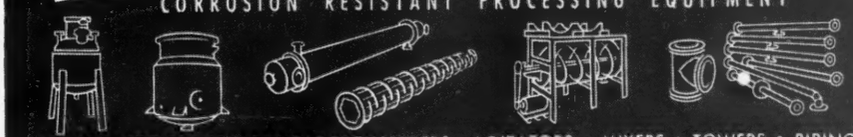

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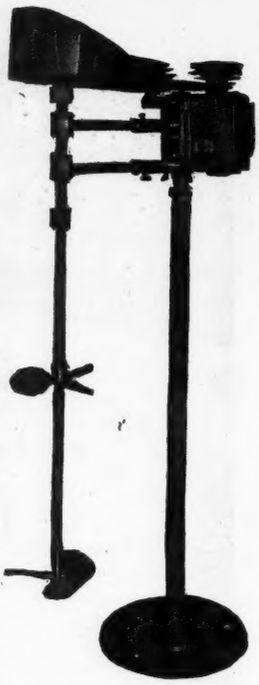

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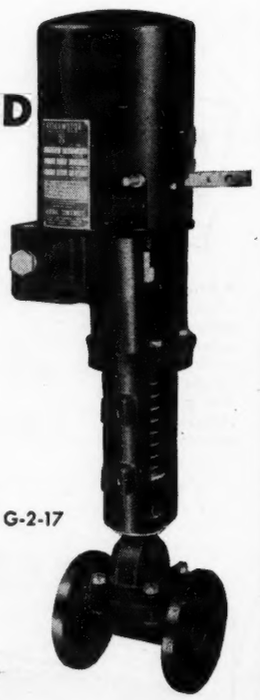

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ment, the man designing the job should sit down with the operator and discuss general power. In some cases, induction motors may be of help; in most cases, capacitors would help.

In conclusion, let me say that I am writing not as an expert on refrigeration, but rather as a dairy plant operator—in the hope that we can arrive at a better plan for reducing refrigeration costs within the dairy industry. It is obvious that in many cases we have need for better planning.

If the dairyman and the refrigeration engineer would sit down and prepare a thermograph, a chart showing refrigeration demands within the plants, and then discuss future expansion of the business, a big step would be taken toward solving refrigerating problems.

Photos of booster compressors and ice cream hardening room courtesy of Frick Company.

—End—

1948 Wheat Crop

(*Continued from page* 120)

lower (10 percent) yeast food increments are indicated for the new crop flour. Gas retention properties are better than last year's crop, entailing lower additions of diastatic malts. Since proteins are higher, tolerance to over-additions of diastatic supplements is better.

Milling Properties

The new wheat mills excellently. The kernels are mature and well filled. Bran coats are average and don't shatter quite as much on the mill as do those of the old crop. This means that the flour contains fewer bran specks. Because of this, there is a possibility of 0.01 to 0.02 percent lower ash content in the various grades of flour.

The well-filled kernels mean better yields—figured at 1 to 1½ percent better on extraction basis. Color of the flour is very bright, and "dress" is excellent. Damaged wheat in the new harvest is very low and consequently will not be a factor in this crop.

Moisture content of the harvest is about normal (11 to 13 percent) and temper requirements for best milling remain unchanged. Higher protein averages and lower ash contents will probably result in revisions of standards on trade-marked flour.

Soft Wheat

At this writing, soft wheat harvest has worked through Southern Illinois Ohio and Indiana and into the northern parts of these states as well as southern Michigan. The new crop wheat is about average in quality,

though somewhat drier than usual. Protein content of the soft wheats is ¼ to ½ percent lower than last year, but protein quality is excellent.

Flour viscosities are 10-20 deg. Macmichael lower than last year. This means softer or weaker flours for the cracker and cookie bakers as well as the cake bakers. This presents no problem, however, and minor adjustments in handling will result in excellent behavior.

Milling properties of the new soft-wheat are in line with those of last year's crop. The lower proteins mean softer middlings, and some cutback in roll and sifter loads will be necessary for best yields. Ash content of the flour is unchanged from last year, but all types of soft wheat flour are brighter in color and finer in appearance. They respond very rapidly to bleaching agents. Accordingly, 5-10 percent lower quantities of these materials are necssary.

All-in-all, an excellent wheat crop is indicated at this time. Rains on the late soft wheat or early frost on the spring wheat could cause some concern as to overall crop quality, but at this time the "horn of plenty" is filled to overflowing.

—End—

Improved Bread

(Continued from page 97)

flour, the quality of the bread also being better.

Summary

Nine points were prominent when the results of the investigation were summarized:

1. A 50 percent decrease in the amount of yeast in the formula gave the best product.
2. A 50 percent increase in the amount of sugar gave a better product than the amount used in the standard formula or when the amount was increased 100 percent.
3. A 50 percent increase in the amount of fat resulted in an unacceptable product.
4. Doughs containing 75 to 100 percent whole wheat flour were not satisfactory for freezing because the breads were too compact and gummy.
5. With no risings before freezing, the doughs could be held in storage longer without showing yeast exhaustion and poor quality bread.
6. Freezing and subsequent storage had little or no effect on the flavor of white bread made from frozen dough stored six to eight weeks. Bread with more than one-half whole wheat flour developed a strong flavor and aroma

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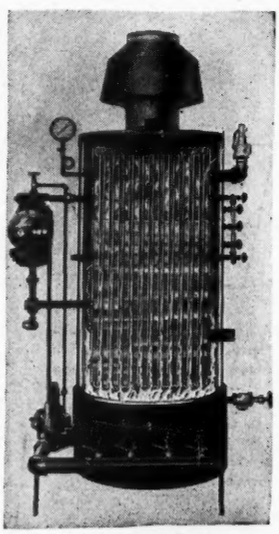

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after the dough had been stored four to five weeks.

7. In general, the texture of breads made from frozen doughs was slightly coarser and less uniform than that of regular bread.

8. It took longer for the dough to rise with each increase in the amount of storage time.

9. Frozen doughs should be thawed in the wrapper. This prevents surface drying of the dough and the development of streaks in the baked loaf.

—End—

Strawberry Preserves

(*Continued from page* 108)

organoleptic tests* on samples stored at the different temperatures were made by the paired-flavor comparison method. These tests were conducted in dark rooms so that the persons tasting the samples would not be influenced by color differences. The results are depicted in Fig. 4.

Changes in Fresh Preserves

In Table I, the anthocyanin content of different varieties of strawberries is given. It is unlikely that these berries contained appreciable quantities of browning pigments. The non-anthocyanin absorption—if significant—is due to constituents other than anthocyanins present in the berries that absorb light at this wave length. The average anthocyanin absorption in fresh berries was 10.8 CRE units; the non-anthocyanin absorption 1.6.

Since strawberry preserves consist of 45 parts fruit and 55 parts sugar, one would expect approximately half the above CRE values in preserves, assuming that there were no deteriorative color changes. As shown in Table II, the average value found for 15 samples of freshly made commercial strawberry preserves was only 2.6 CRE units of anthocyanin absorption and 2.4 CRE of non-anthocyanin absorption.

The increase of non-anthocyanin absorption in comparison with the fresh berries can only be explained by the formation of browning pigments. This indicates that considerable loss of anthocyanin, and an increase in the non-anthocyanin absorption due to "browning" reactions, occurred during manufacture.

Figs. 1 and 3 show the color changes in preserves during storage. Preserves used in these tests had an exceptionally good color. As expected, a progressive decrease occurred in anthocyanin content during storage, the loss being

* We are indebted to Prof. J. C. Hening for conducting these tests, also to other colleagues for their participation.

more rapid with higher temperatures.

For example, the loss at 75 deg. F. is slightly greater after two months than the loss at 65 deg. F. for six months. At 34 deg. F., the loss after six months is only half as great as that found at 65 deg. F. after two months. At temperatures above 90 deg. F., most of the red color was lost during two months of storage.

There seems to be an acceleration of the rate of color loss as the temperature of storage exceeds 65 deg. F. And above this temperature, the red pigment is lost much more rapidly than could be attributed to the velocity of a simple chemical reaction as affected by the temperature (Fig. 2). It is apparent that some critical point is reached as the storage temperature passes the 60 to 70 deg. F. range This acceleration in the loss of the anthocyanin at this critical temperature range seems to be typical of the early phases of color deterioration. Obviously, the color loss in this range is of practical significance.

Needless to say, the extent of loss in color can not be expected to be the same in different lots of strawberry preserves, since this will be greatly influenced by: (1) The original color content of the product, (2) the extent of color loss which has already occurred (as during manufacture), and (3) that likely by other unknown factors.

Brown Discoloration

We have found, as did other investigators, that the loss of red pigment in strawberries is accompanied by the development of secondary brown coloration. The measurement of these slowly developing colored complexes is difficult. For want of better methods, we have used the non-anthocyanin absorption at 500 milimicrons for their measurements.

Certain facts make it difficult to find an accurate method for measuring browning. These are:

1. A wave length of 500 millimicrons is too sensitive for measuring browning pigments. Whereas, as stated above, the anthocyanin spectrum has a definite peak of absorption in the visible range, such is usually not the case with the typical browning pigments.

2. It seems certain that the "secondary" pigments do not follow Beer's law at all stages. Usually it is only the yellow and orange intermediates that show this relationship.

Data changes in the non-anthocyanin absorption of strawberry preserves during storage are difficult to explain on the basis of our present knowledge of browning reactions.

Referring to Fig. 3, where the non-anthocyanin absorption values are plotted against storage temperature, it

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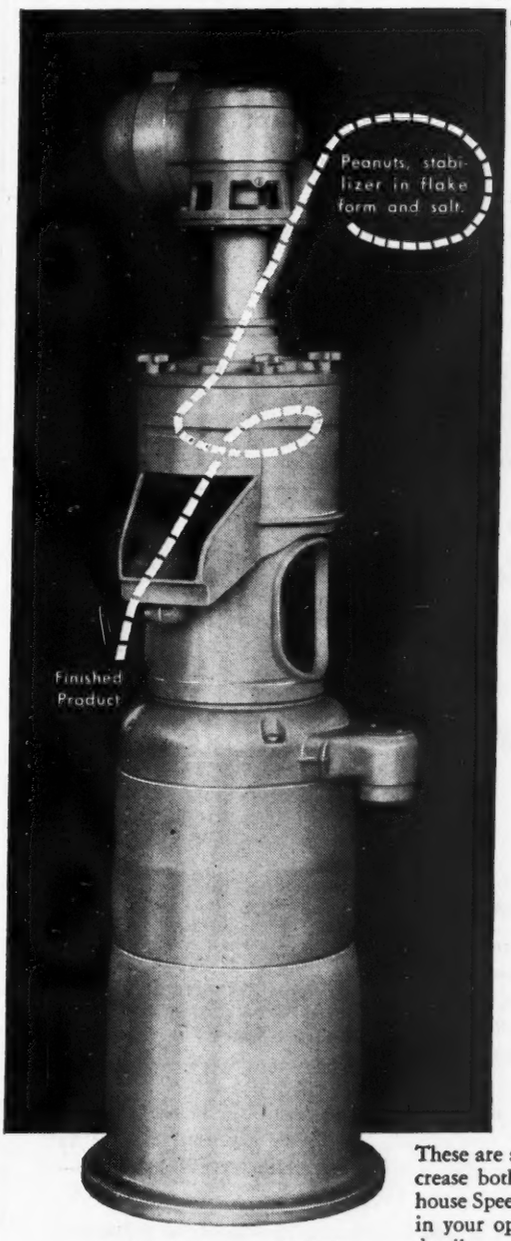

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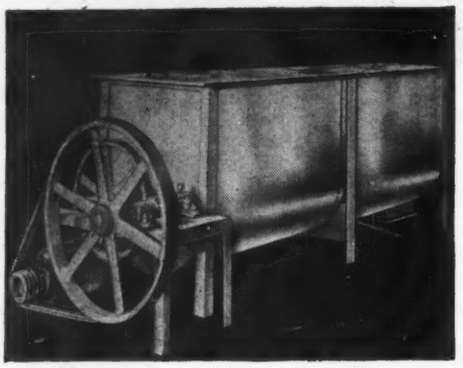

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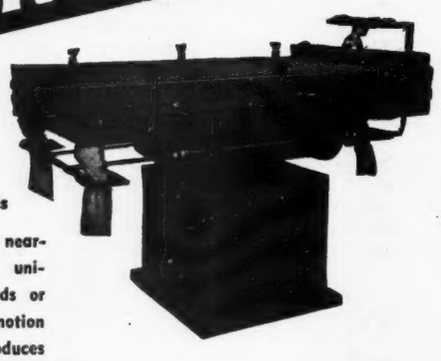

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is only in samples stored at 98 deg. F. that there is a steady increase in non-anthocyanin absorption. At other storage temperatures, the non-anthocyanin values are at a minimum. These decreases in the non-anthocyanin absorption curves occur in the same temperature region where the loss of anthocyanin seems to be accelerated. Consequently, some relationship might exist between these two observations.

It is significant that the development of these brown-colored compounds was negligible in samples stored under conditions where the loss of red color was low, and that this secondary discoloration was always preceded by a major loss of red anthocyanin pigment. This indicates that the browning reaction is likely to occur when the red color already has been sufficiently destroyed to impair the commercial value of the product.

A more complete definition of the color of a strawberry preserve might be obtained by using, in addition to its anthocyanin content, the ratio of the anthocyanin and non-anthocyanin absorption at 500 millimicrons. Such values are shown in Table II, which also includes some stored samples for the sake of comparison. From present experience, it seems that a well-colored strawberry preserve should have a red color value in excess of 2.0 CRE units and an "anthocyanin CRE non-anthocyanin CRE" ratio of not below 1.0.

Of additional interest is the progress of flavor changes in stored samples. As noted above, extensive tests have been made to evaluate the flavor of the stored samples (findings in Fig. 4). Undesirable changes in the flavor of a strawberry preserve with an initially good flavor and color are slight until after the loss of 50 percent of the anthocyanin. At this point, the flavor score was only 10 percent below the value assigned to the original preserve.

References

1. C. S. Pederson, H. G. Beattie, and E. H. Stotz, "Deterioration of Processed Fruit Juices," New York State Agricultural Experiment Station Bulletin No. 728, 1947.
2. H. H. Thompson, S. R. Cecil, and J. G. Woodroof, "Stored Frozen Stock Produces Better Preserves," FOOD INDUSTRIES Vol. 18, p. 1341, 1946.
3. Z. I. Kertesz, "Storage Behavior of Fruit Spread," *Glass Packer*, Vol. 26, p. 208, 1947.
4. E. Sondheimer and Z. I. Kertesz, "The Anthocyanin of Strawberries," accepted for publication in *J. Am. Chem. Soc.*
5. H. M. Barns and C. W. Kaufman, "Industrial Aspects of the Browning Reaction, *J. Ind. Eng. Chem.*, Vol. 39, p. 1167, 1947.
6. E. Sondheimer and Z. I. Kertesz, "Anthocyanin Pigments—A Colorimetric Determination in Strawberries and Strawberry Products," *Anal. Chem.*, Vol. 20, p. 245, 1948.
7. K. P. Link, "The Anthocyanins and the Flavones." In H. Gilman, *Organic Chemistry*, Vol. 12, John Wiley and Sons, New York, N. Y., 1943.
8. W. B. Robinson, F. A. Lee, G. L. Slate, and C. S. Pederson, "Chemical Composition and Freezing Adaptability of Strawberries," New York State Agricultural Experiment Station Bulletin No. 726, 1947.

Computing Checks

(*Continued from page 75*)

ment in the machine, alongside his stack of earnings records and checks, all in numerical order by departments. He checks the name and number of the form on the top of each stack with those on the time card, places the forms in the machine, and makes the gross earnings computation by calculator. He then proceeds to manually post the remainder of the data desired. Thus, the posting of payroll statement, earnings record and informative receipt for the employee is accomplished in a single operation.

His posting completed, the clerk then removes the earnings record, check and stub. After moving the adapter down one space—to be in correct alignment with the next space on the payroll summary—he inserts the next employee's earnings record, check and stub and repeats the process.

Because of the simultaneous posting, the only item remaining is to check with the mathematical extensions on the payroll statement—and to write the checks. These are written and signed by Protectograph machines — one shredding the amount line, and the other impressing the signature, through use of a specially-designed plate with the treasurer's signature superimposed on a four-color background.

Mr. Mauer reports that all checks and records are completed by two clerks long before 5 o'clock on Monday, so that the checks will be ready for prompt distribution the next day. He says that for his firm of meat-packers the system has cured every headache of payroll preparation.

—End—

Use of Aluminum

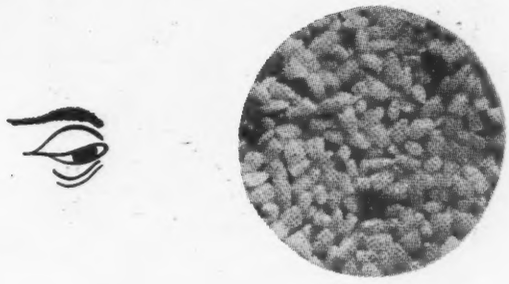
(*Continued from page 87*)

tact—for it is known that corrosion can be greatly influenced not only by the structure and composition of the metal at the surface but also by the power of ionized substances in solution to penetrate, undermine or dissolve the film.

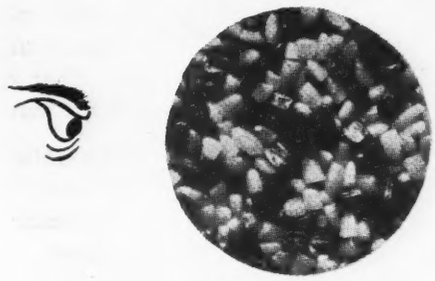
It was necessary to consider the action of simple aqueous solutions—acids, salts, inhibitors—in order to gain an insight into the corrosion by complex substances such as foods.

Space is given in the text to the question of the possible toxicity of aluminum. It is pointed out that aluminum is not a poisonous metal and has not been known to give rise to any disease. Five generations of rats were fed on foods which were not only packed in aluminum containers but

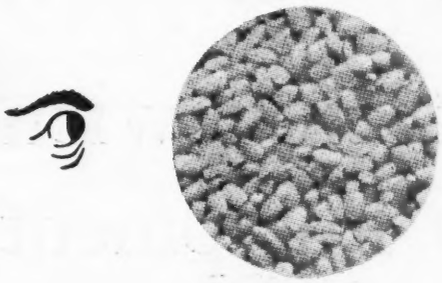
now, watch this carefully!



ORIGINAL RICE



TAILINGS



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which has also relatively large amounts of the metal intermixed, and it was shown that the growth and fertility of the rats continued entirely normal, with the aluminum completely excreted.

The metal occurs naturally in plant and animal tissues, and some authorities go so far as to claim that its presence may even be necessary for the normal healthy development of organic life.

Aluminum does not accelerate the destruction of vitamins during cooking, even at boiling temperatures. It has no effect on fermentation by yeasts, and it does not promote rancidity of oils and fats. Aluminum utensils are very resistant to corrosion by food stuffs cooked in them.

The handbook is divided into four sections. In the first part, properties of the metal are considered, and the surface film is discussed as regards its effect in relation to the different types of corrosion which may develop. In the second part there is a detailed account of the corrosion by aqueous solutions, while the third part covers thoroughly the corrosion by the various kinds of food products and beverages. The last section is devoted to the different methods for protecting aluminum: By oxide coatings, metallic coatings, cathodic protection, paints and lacquers.

—End—

Nutritional Improvement

(*Continued from page* 103)

making appropriate foods serve as carriers of dietary essentials which are inadequately supplied by many diets.

"In any case the addition of synthetics to natural foods must depend on the prevention of known deficiencies in groups of the population and not on the utilization of synthetic products which happen to be available at low cost.

"The Council disapproves of unlimited or indiscriminate fortification of general purpose foods with minerals, vitamins, amino acids or other nutrients. It likewise disapproves of artificial combinations of edibles designed to carry vitamins, minerals, amino acids or other nutrients for the use of the general public."

Dr. Elvehjem is for a variety of natural foods, plus technological safeguards and improvements. Nutritionists, he says, must never forget that adequate nutrition can be obtained only through a variety of appetizing and appealing food products. But something more than appetite appeal is needed.

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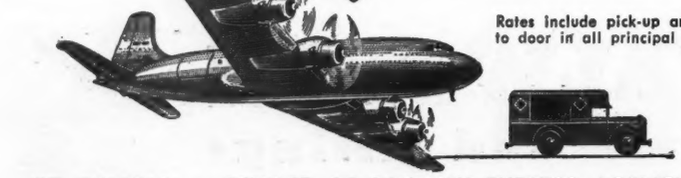

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to overcome local practices which have grown up around certain food products and around accepted dietary habits which tend to precipitate deficiencies in population groups. Nothing has been more effective in reducing nutritional deficiencies in this country than the wider and more uniform distribution of milk, meat, fruits and vegetables through the packaging of these products in more attractive and useful forms and through the availability of these products at relatively low cost.

"But modern food technology has gone much farther. For example, the availability of vitamin D milk has practically eliminated rickets in the children of this country.

"The enrichment program which returns, to white flour and bread, the essential nutrients lost in milling, has done much to safeguard nutrition in many groups of people. These programs were not carried out without great cost and effort on the part of the food industry".

Lest the processor become complacent, Dr. Elvehjem pointed out in his Philadelphia address that greater progress could have been made in the case of many dietary elements. The iodized salt program, for example, has been lagging, but something constructive can be done when everyone concerned does his part.

Losses To Be Expected

Dr. Elvehjem doubts if food processing can be so modified as to prevent any loss of vitamin. Vitamin loss need not be disturbing, however, since a year's supply—in the case of thiamine —may be provided for ten cents at wholesale. This view, however, does not mean advocacy of the synthetic vitamin.

A converse situation prevails in the case of biotin, where processing may actually result in the release of the active material. Similarly, short time heat treatment of soy flour may result in improvement of availability of nitrogen compounds. Excessive heat may impair them. Soy differs in this respect from casein owing to the carbohydrate in soy.

It becomes increasingly evident that many of the nutrients cannot be considered apart from others. A change in the amount of one may alter the need for another. Significantly, an interrelation was recently established between niacin and the amino acid tryptophane. This leads to specific conclusions in the case of a product such as corn, which is low in tryptophane. Protection against pellagra is afforded by fortifying corn with niacin, or by using it in conjunction with milk, eggs or meat, which supply extra amounts of tryptophane. Meat, on the other

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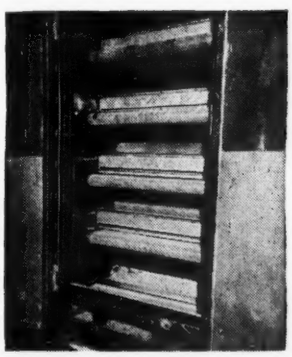

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hand, is an excellent anti-pellagra food because it is rich in both niacin and tryptophane.

Value of Mixtures

This prompts Dr. Elvehjem to suggest that much could be done to improve the quality of diets in many areas through the manufacture of food mixtures. "Optimum nutrition cannot be obtained without paying attention to all the essential nutrients and food processing will not be successful until recognition is given to each of these essential nutrients.

"The possibilities for the future are tremendous. Better distribution of high quality natural foods can be continued and improved. Nutritional value of some of these natural foods can be increased by the proper type of processing. Certain combinations of foods may be not only more appetizing but more highly nutritious.

"The availability of synthetic vitamins and perhaps other nutrients in synthetic form will help in the improvement of foods if they are properly used. But in any case, it is possible to carry modification and changes too far and that is why we need research workers to tell us where to go and how far to go."

—End—

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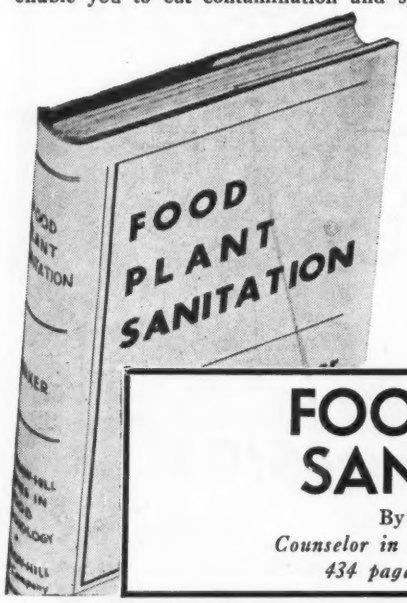

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